THE FOUNDRY

CONVENTION NUMBER

APRIL 1896

VOLUME VIII
No 44

THE FOUNDRY PUBLISHING CO
DETROIT MICH

Plumbago FOR 3 Cts PER POUND

UNTIL our next advertisement appears in The Foundry, we will fill all orders for our A1 Finest Ground Royal Plumbago at 3 cents per pound in barrel lots.

Not more than One Barrel will be sold to One Concern.

Royal Plumbago will answer admirably for all purposes for which Ceylon Plumbago, India or Silver Lead are used in the foundry or core room. You will find it equal to any higher priced Plumbago you ever used. If it should happen that you are not needing Plumbago at the present time, we feel it would be to your advantage to send us your order for a barrel of it anyhow. If it is not satisfactory, we take it back. We have several objects in offering this brand of Plumbago at this time at such an extremely low price. We are ready to make equally low prices on anything that you may want in the foundry supply line, and are positive it will pay you well to send us a list of your wants and receive in return our prices. When replying to this advertisement, do not fail to mention "The Foundry."

The J. D. Smith Foundry Supply Co.

Manufacturers of
Foundry Facings and
Blackings
Foundry Supplies

and
REFINERS OF
PLUMBAGO

CINCINNATI, OHIO.
U. S. A.

TWENTY YEARS and over, we have been so intimately associated with the foundry business of America that we are naturally deeply interested in anything that concerns that industry. Its prosperity has always been our prosperity, and in return we think we have, by the aid of original experimenting and research, done something in the way of improving the standard of foundry facings to an extent that has had much to do with the magnificent castings being turned out of American foundries. We congratulate the foundrymen of America on the step they are about to take to form a National Association. It is a move that may be in many ways a great benefit and we sincerely desire its success.

With kindest regards and best wishes, we remain,

THE S. OBERMAYER CO.

The Largest and the Standard Foundry Supply House of the World.

We mention a few

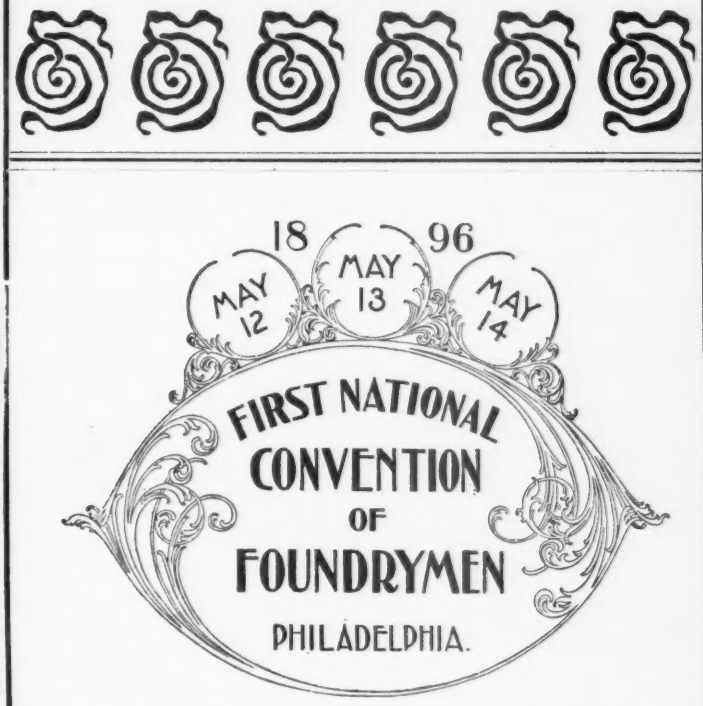
DANUFACTURES, Supplies . . and Equipments which we carry in stock—Ceylon Plumbago, India Silver Lead, Founders' Perfect Wash, Heavy Machine Blacking, Heavy Stove Plate Facing, National and Eagle Return Facing, Soft, Hard, and Steel Wire Brushes, Brass, Galvanized and Steel Wire Riddles, Bellows, Shovels (all grades), Coke Forks, Molders' Tools, Wheelbarrows, Snap Flasks, Pattern Letters, Ladles, Crucibles, Emery Wheels, Sea Coal, Stone Coal, Bituminous Facing, Core Compound, Soapstone, Foundry Flour, Talc, Bolted Cement, Foundry Molasses, Fluor Spar, Stove Putty, Silica, Brass Sand.

All Goods Guaranteed. Trial Samples Free.

The S. Obermayer Co.

Cincinnati, Ohio.

Factories at Cincinnati, O., Chicago, Ills., Larimer, Pa., White Haven, Pa.



THE "LATCH STRING IS OUT!"

When you come to the Convention, why not call on us. We will try to give you a reception befitting the Quaker City.

Yours very cordially,

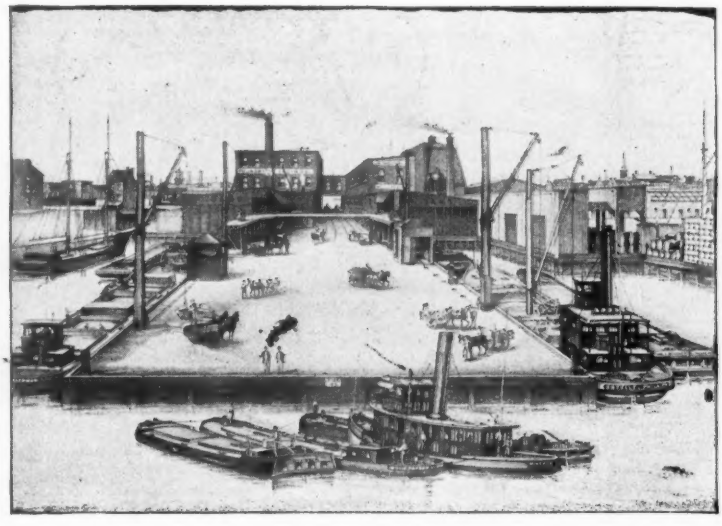
J. W. PAXSON & CO.

PIER 45 NORTH or
No. 1021 NORTH DELEWARE AVE.

PHILADELPHIA, PA.

A Point of Interest and Profit to

Foundrymen



From Third and Market Streets take north bound car marked "Richmond;" leave car at Front and Laurel Streets and walk two blocks East.

"Cramps Ship Yard" and "Penn Treaty Park"

. . . within a few blocks of us . . .

J. W. PAXSON & CO.

MANUFACTURERS

Foundry FACINGS
SUPPLIES
EQUIPMENTS

Molding Sands . .
Silica Sand . . .
Core Sands, Clay, &c

PIER 45 NORTH PHILADELPHIA, PA.

Competition in foundry trade is far greater than ever before. . . . . .

Foundrymen to hold your own, make fine castings, for they are demanded. . .

You can make the finest castings only by using

C. F. M. FOUNDER'S PERFECT WASH

Manufactured for Loam, Dry Sand,
Skin Dried or Cores of any size. . .

HEAVY A. A. PURE PLUMBAGO

FOR GREEN SAND WORK.

MANUFACTURERS OF

FOUNDRY FACINGS
FOUNDRY SUPPLIES
FOUNDRY EQUIPMENTS

The Cleveland Facing Mill Co.

CLEVELAND, OHIO.

"John, I want six off this to-day and must have first-class castings. Be sure and use only KELLY'S PLUMBAGO, as they have got to be nice."

T. P. KELLY & CO.

MANUFACTURERS OF

Plumbago, Foundry Facings and Blackings.

DEALERS IN

FOUNDRY SUPPLIES

We are the largest grinders of PLUMBAGO for FOUNDRY purposes in the United States. Our "B. M." brand of PLUMBAGO will assimilate with any SAND.

It is thoroughly purified, being chemically free of

ALUMINA, SILICA, MICA

AND OTHER IMPURITIES.

We GUARANTEE SMOOTH CASTINGS and satisfactory results wherever it is used.

MILLS AT
BLOOMSBURY, N. J.
AND
REISSING, PENN.

CHICAGO OFFICE:
121-127 NORTH ADA ST.
NEW YORK OFFICE:
284 PEARL ST.

JAS. THOMSON, President. J. G. ALLAN, Vice-Pres't & Mgr.

FOUNDRY
FACINGS

THE HAMILTON FACING MILL CO.

LIMITED

MANUFACTURERS OF

FOUNDRY FACINGS
CORE COMPOUND AND
FOUNDRY SUPPLIES

IMPORTERS OF

EAST INDIA PLUMBAGO, GERMAN LEAD, FIRE BRICK, FIRE CLAY, CRUCIBLES, ETC.

SHIPPERS OF

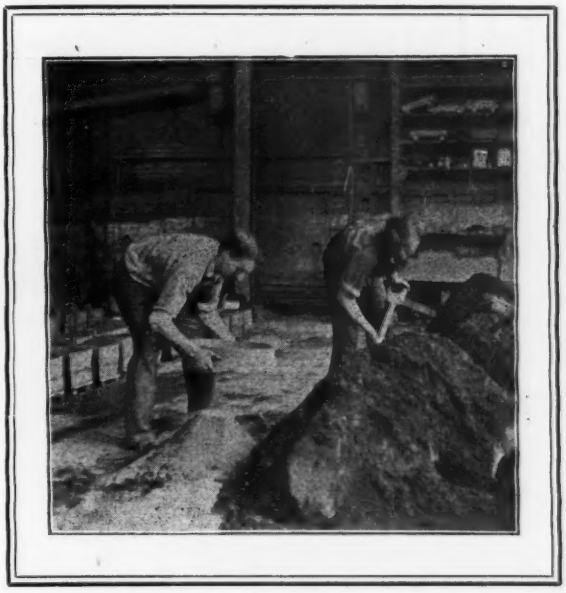
...Canadian Molding Sand...
For all classes of work.

Our Goods are used in all the Principal Foundries from Halifax to Vancouver.

OFFICE AND MILLS,
HESS STREET NORTH,
TELEPHONE No. 940

HAMILTON, ONT. CANADA.

McCULLOUGH DALZELL COMPANY
MANUFACTURERS OF
CRUCIBLES · STOPPERS
AND ALL ARTICLES CONTAINING PLUMBAGO
PITTSBURG, PA. U.S.A.



SAND!

TO SAY THAT A MAN

"HAS NO SAND"

is to refer to him in a decidedly uncomplimentary manner. Nearly as bad to say that his sand is no good. When referring to us, however, our friends—that is to say, our customers—always grow enthusiastic. . .

THE REASON WHY

We mine and ship more sand than any concern in the Eastern or Central States is simply because, when we get a customer once, he is ours for good. We see that he gets exactly what he wants and that it's free from every kind of impurity.

Fine, Core, Molding Sand, Crushed Rock,
. . . Fire Clay . . .

Twelve Years' Experience In Mining and Shipping SAND and CLAY, enables us to ship you just what you need. We can send you any grade of MOLDING SAND you may require, from the finest to the coarsest, and guarantee quality always the same. Order our No. 0 Sand for Brass Castings; our No. 1 for Light Work; our No. 2 for Medium Heavy Stove Plate; our No. 3 for Medium Weight Castings, Light Machinery and Car Wheels; our No. 4 is the best Sand in use for Heavy Castings of any kind. It is an extra good wearer and is always sure to turn out a perfect casting.

E. M. AYERS ✻ **108 MAIN STREET, ZANESVILLE, O**

Crucible.

Crucible

Dipper.

Cover.

Stopper.

Crucibles

For melting Steel, Brass, Copper, Gold, Silver, Nickel and Metals and Alloys of Every Description; Small Crucibles for making Assays and fine pure Plumbago for labricating, etc.

Now is your opportunity, when you come on to the Convention of the Foundrymen in May, call and see us. We will be pleased to take you through our Works and show you how a Crucible is made, and give you any information you may desire; we make all sizes, from 8 oz. to two ton capacity.

We are practical workmen and have studied the requirements of the different metal works in this country, as well as in Europe. We also work strictly by chemical analysis, giving a uniformity at all times never before approached in this or any other country.

ROBT. J. TAYLOR & SON,

1900 to 1916
CALLOW HILL STREET, PHILADELPHIA, PA.

CHAS. M. JARVIS, President and Chief Engineer.
GEO. H. SAGE, Secretary

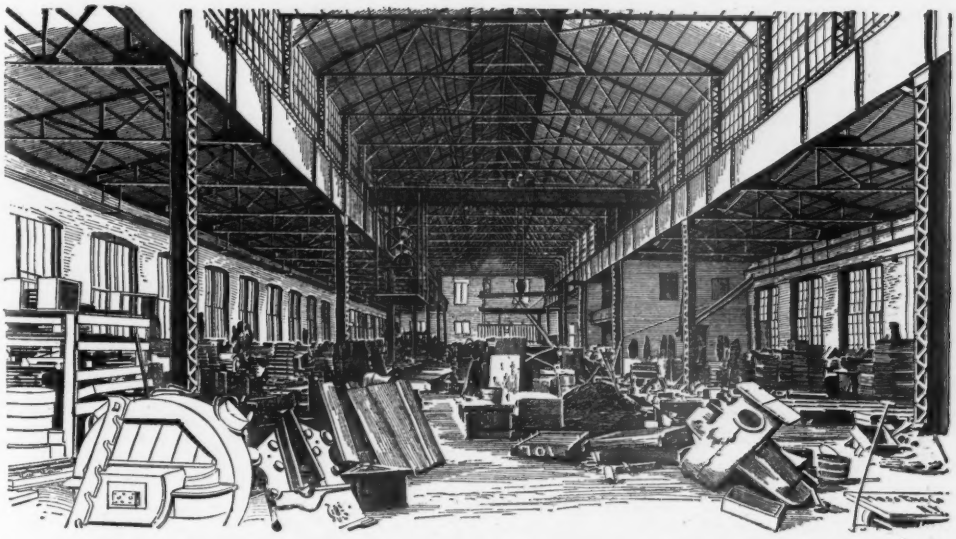
BURR K. FIELD, Vice-President.
F. L. WILCOX, Treasurer.

THE BERLIN IRON BRIDGE CO.,

ENGINEERS, ARCHITECTS

—AND BUILDERS OF—

Iron and Steel Bridges, Roofs and Buildings.



The above illustration is an interior view and shows a foundry building designed and built by us for the Pratt & Cady Co. at Hartford, Conn. The central portion is 35 feet in width with a 15 ton crane, having a travel the full length of the building. Each wing is 20 feet in width and the entire building is 225 feet in length, constructed entirely of brick, iron and glass, no wood work being used about the building in any way, except in the window sash and casings. The building is absolutely fire proof.

Office and Works, - - EAST BERLIN, CONN.

SEND FOR ILLUSTRATED CATALOGUE.

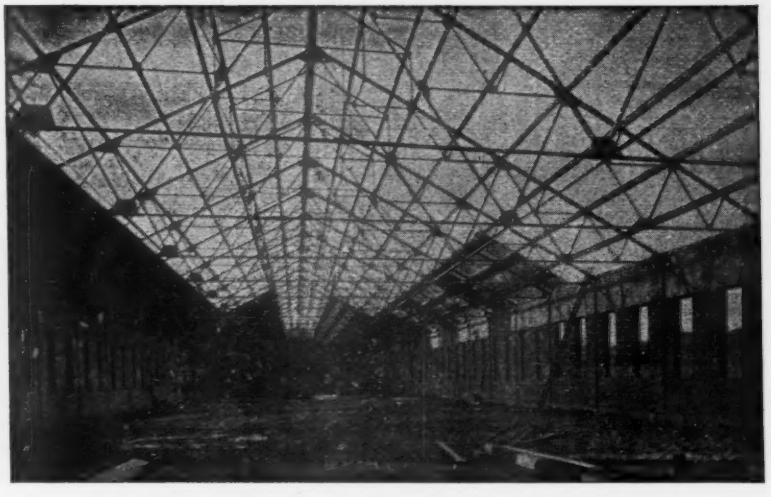
Wrought Iron Bridge Co.,

DESIGNERS AND BUILDERS IN
IRON AND STEEL
FIRE PROOF BUILDINGS

—FOR—
FOUNDRIES, MACHINE SHOPS
ETC., ETC.

Exterior of Foundry of Warder, Bushnell & Glessner Co., Springfield, Ohio.

Traveling and Jib Cranes for handling
Heavy Castings and Machinery.



Buildings Designed for Special
Requirements.

Interior Foundry Building of Warder, Bushnell & Glessner Co., Springfield, Ohio.

The roof of this building was erected by the Wrought Iron Bridge Co., Canton, Ohio, and consists of steel trusses supporting wooden purlins to which matched and dressed sheeting is nailed for slating. Trusses being 18 ft. above the floor, the wood work of roof is out of danger from fire, while the cover being of slate a suitable cornice to protect the overhanging of roof from flying sparks, or heat from the burning of neighboring buildings, renders this structure absolutely fire proof. Windows are set in the sides of ventilator throughout its entire length, so that ample light and ventilation is insured.

Wrought Iron Bridge Co.

ADDRESS NEAREST OFFICE.

CANTON, O. KANSAS CITY, MO. CHICAGO, ILL.

186 Liberty St., NEW YORK.

Just Enough Wind

∴ ∵ ∴ and at the right pressure for the best results is what you obtain with a

ROOTS' POSITIVE PRESSURE BLOWER

OUR CATALOGUE is interesting.
OUR TESTIMONIAL SHEET convincing.

WRITE FOR THEM.

SATISFACTORY IN EVERY RESPECT. NO COST FOR REPAIRS.

DAYTON, OHIO, February 26th, 1895.

P. H. & F. M. ROOTS CO., Connersville, Ind.

Gentlemen:—It gives us great pleasure to comply with your request for a statement of our experience with your Blower. We are using a No. 5 Blower driven by belt, and it is melting eight tons per hour in a forty-inch Colliau cupola. We think it safe to state, however, that the Blower would easily furnish sufficient wind to melt ten tons per hour. We have had it in use about three years, during which time it has cost us nothing for repairs, and we have found it very satisfactory in every respect.

Wishing you the continued success, which the good qualities of your machinery merit, we remain,

Yours truly,

THE STILLWELL-BIERCE & SMITH-VAILE CO.

By G. N. Bierce, Secretary.

P. H. & F. M. ROOTS CO.

Connersville, Ind.

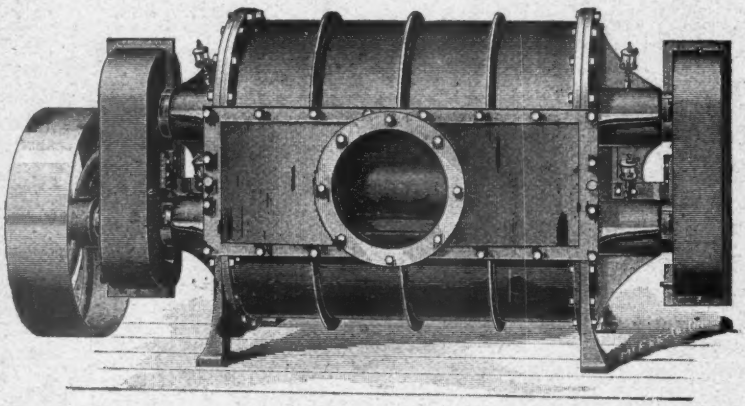
OVER

25,000

ROOTS' POSITIVE PRESSURE BLOWERS

Have been put on the Market.

1859



1896

They are Unequalled.

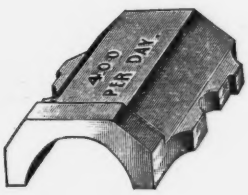
P. H. & F. M. ROOTS CO.

CONNERSVILLE, IND.

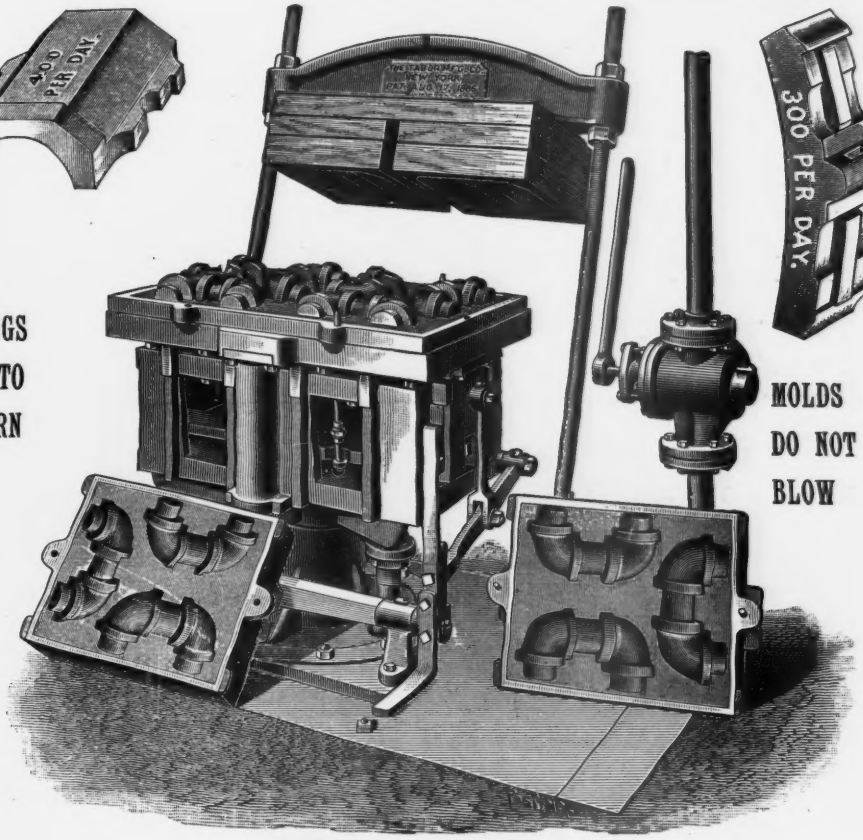
ONE MAN'S WORK

—WITH THE—

TABOR AUTOMATIC MOLDING MACHINE.



POURS CASTINGS TRUE TO PATTERN



MOLDS DO NOT BLOW

DUPLEX MACHINE.

Molds both parts of flask at one operation of machine, thus making two machines in one.

These machines are adapted to general castings when made in reasonable quantities.

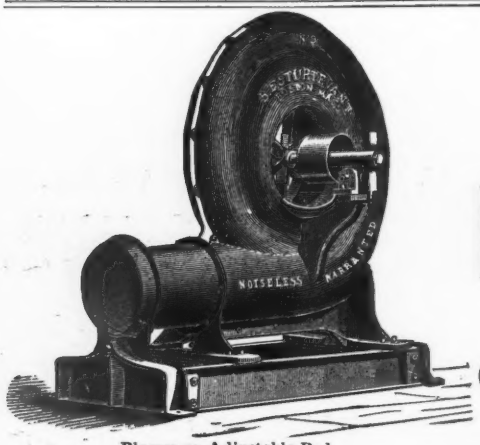
The use of these machines is a guarantee of economy, greater quantity and better quality in castings.

Foundrymen who are interested in producing cheap castings of superior quality are invited to correspond with the Company and call at the works, Front and Franklin Streets, Elizabeth N. J., and see the machines in operation.

The Tabor Manufacturing Co.

39 Cortlandt Street,

NEW YORK, - - - N. Y.



Blower on Adjustable Bed.

THE STURTEVANT STEEL Pressure Blowers,

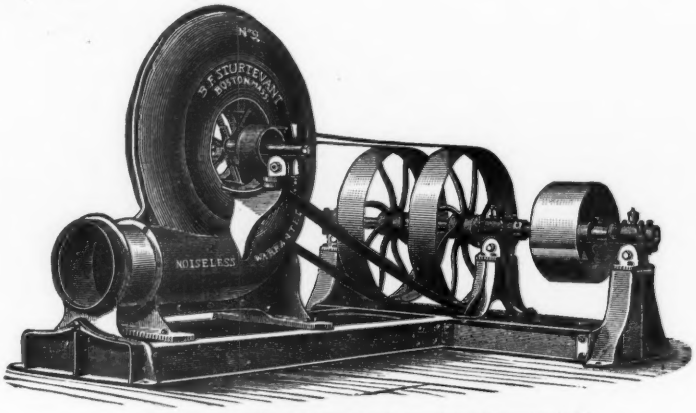
—FOR—

Cupola Furnaces and Forge Fires.

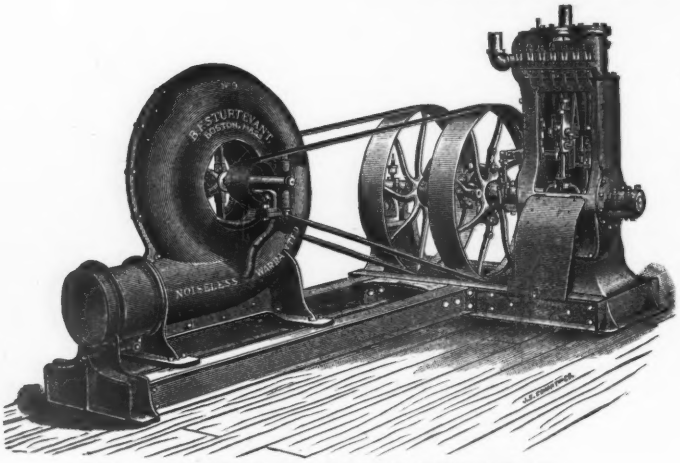
BLOWERS

Furnished without Bed with Separate Countershaft

BLAST GATES



Blower on Adjustable Bed with Combined Countershaft.



Blower on Adjustable Bed with Double Enclosed Engine.

BLOWERS

WITH

THE STURTEVANT

Direct Connected

Electric Motors

Send for Catalogue.

B. F. STURTEVANT CO.,

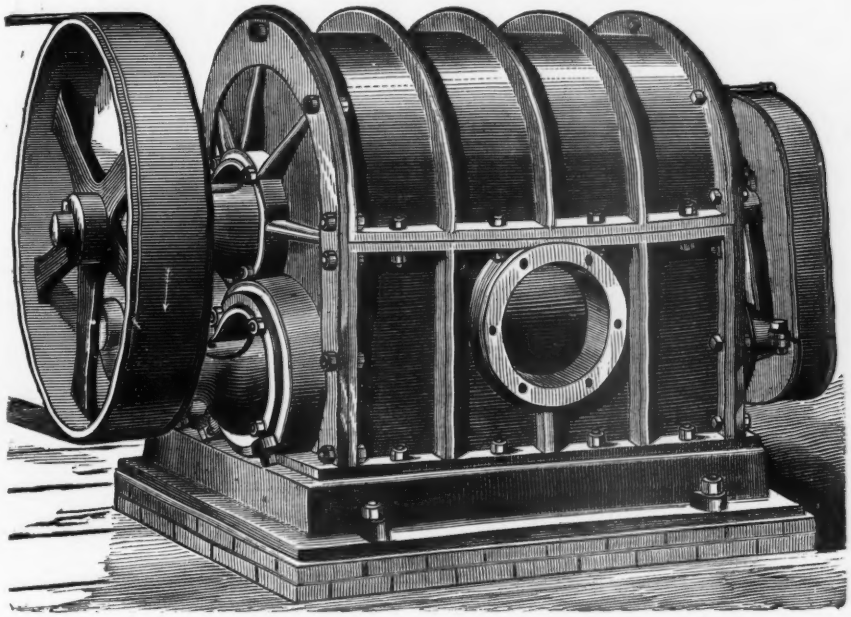
BOSTON, MASS.

91 Liberty Street, NEW YORK. 135 N. Third St. PHILADELPHIA.
16 S. Canal St. CHICAGO. 75 Queen Victoria St. LONDON.

STOCK CARRIED AT BRANCHES.

The Baker Rotary Pressure Blower

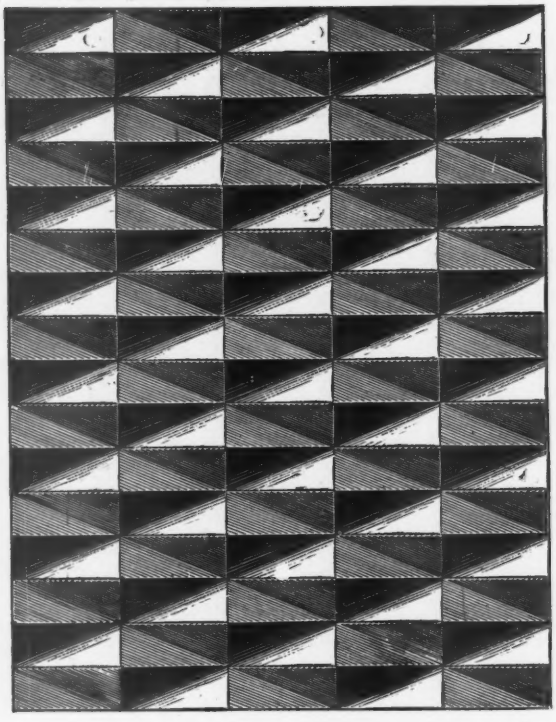
ONLY ONE BELT IS REQUIRED TO DRIVE THE LARGEST BLOWER.

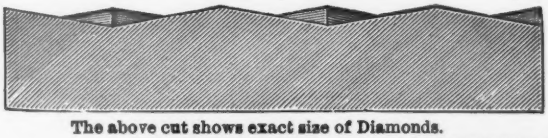


The Best POSITIVE PRESSURE BLOWER for IRON FOUNDRY CUPOLAS, Pneumatic Tubes, Water Gas Works, Smelting Silver, Lead, or Copper Ores, Sand Blast, Forge or Knobling Fires, Ventilating Mines or Tunnels or any other purpose requiring a POSITIVE BLAST OR EXHAUST.

Wilbraham Baker Blower Co.,

2518 Frankford Ave., PHILADELPHIA, PA.





The above cut shows exact size of Diamonds.

Diamond Pattern Lumber,

—FOR—

DOOR SILLS, PLATFORMS, STEP PLATES, Etc.

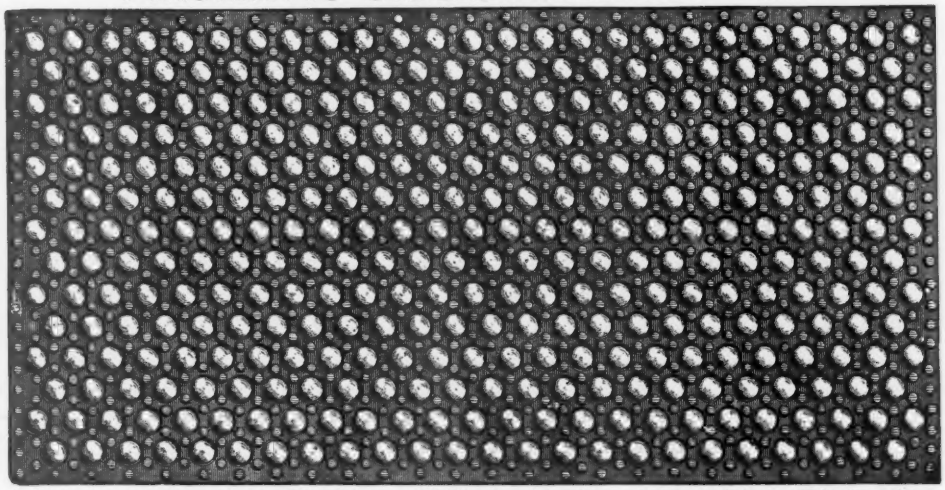
This Patent Lumber is made by a Special Machine invented by us, the ONLY Machine of its kind, and each piece will match PERFECTLY with all other pieces, by "joining" the edges to the centre, lengthwise, or any row of Diamonds.

Size of each piece, 8 feet long by 6 inches wide, and ½ inch thick. Price 10 cents per running foot of 6 inches in width, NET CASH crated and delivered f. o. b. Chicago, in orders of not less than 6 pieces. Send for sample.

BROWN BROS. MFG. CO.

Cor. Clinton and Jackson Sts. Chicago.

PRISMATIC SIDEWALK LIGHT TILE.

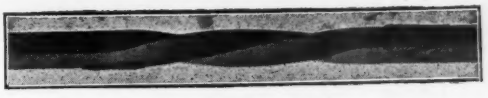


Make your own frames and we will furnish you with Tiles for either Iron or Concrete Lights. Write for prices.

BROWN BROS. MFG. CO.,

Mention THE FOUNDRY. **Cor. Jackson and Clinton Sts. CHICAGO.**

Just stop right here!



This cut made from Photo of 1-2 inch Test Bar poured direct from furnace with Clinton Iron and twisted.

We are going to talk business—straight! and want this "ad" read carefully.

"You'd better believe it!"

AS a foundryman, you know (from bitter experience probably) that everything you make is sold on inspection. "Yes, that is so," we hear you say. How much of the material you use is inspected? Think carefully before answering that. Well, we know your answer and ask another question. Do you think it pays to buy an uninspected raw material to make into a rigidly inspected product?

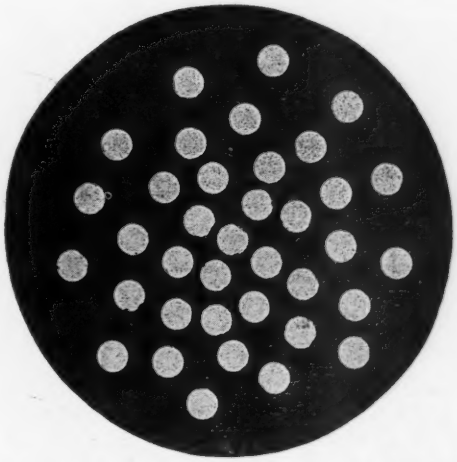
The foregoing is educational, the following is practical.

Every car of

Hector and Clinton

Foundry Iron is inspected. (Our Chemical and Physical Laboratory is One of the Largest in the World.) We use only the best material, watch every point in its manufacture and the result most carefully, and when we sell a car of iron, we know just what we are delivering.

That accounts for the reputation our iron has made wherever used and the complimentary letters we receive almost daily.



This cut made from Photo of a Plate poured with Clinton Iron direct from blast furnace; size, 4 3-8x1-8 thick. The 41 1-4 in. holes were punched out cold without cracking it.

CLINTON IRON AND STEEL CO

PITTSBURG, PA.

15 Cortland St., N. Y.

ISN'T IT AMUSING?

THAT metal workers should try to work in wood!!! And the wood-working tail wags the dog.

Did you ever have that tired feeling—waiting for a pattern you expected to have had in the sand a week previous?

Do you make your own set screws, glove valves, or rubber packing?

If you need a milling machine or gear cutter do you make it in your own works? Why not?

Wouldn't it be a grand thing to make such where you could "see them as they go along?"

Did you ever do an odd job of upholstering or carpentering in your own machine shop?

WE MAKE PATTERNS!

We do nothing else. It is our business. Those who patronize us **save money**. If you think we are not making a success of this specialty, get a commercial report on us and find out. We have the largest Pattern Works in the World and can get almost any job out in one week. Once we made $17,500.00 worth of patterns for one man inside of ninety days.

SEND YOUR BLUE PRINTS HERE!

The Gobeille Pattern Co.

CLEVELAND, O.

ESTABLISHED 1875.

STOW M'F'G. CO.

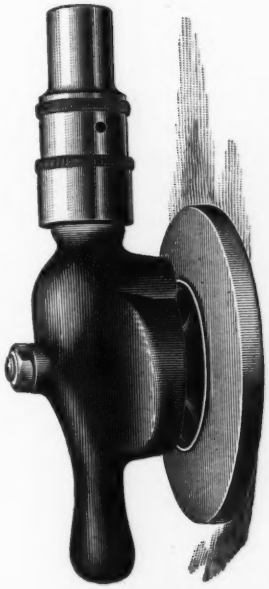
BINGHAMTON, N. Y.

Inventors and Manufacturers of the

Stow Flexible Shaft

——FOR ALL PURPOSES——

Emery Grinding,
Wood Boring,
Drilling, Tapping,
Reaming, Etc.



PORTABLE EMERY GRINDER.

For no tool we manufacture has there been so rapidly increasing demand as for our **Portable Emery Grinder.** It is giving perfect satisfaction to hundreds of our customers. For cleaning and grinding heavy castings, for buffing and polishing all metals and glass it is almost indispensible, and a great time and labor saver. The above cut shows the tool running emery wheel on edge—below we illustrate our appliance which is to be substituted for the clamp spindle when grinding, shaping and polishing flat surfaces.

Write for Catalogue and Price List.

STOW M'F'G. CO

BINGHAMTON, N. Y.

"THE WELLS LIGHT"

WALLWORK & WELLS' PATENTS. (Registered Title.)

OVER 10,000 IN USE.

ALWAYS READY!

800 TO 2000 CANDLE POWER

ESPECIALLY ADAPTED FOR

Foundries

PORTABLE
SELF CONTAINED
AUTOMATIC

No Smoke! No Spray! No Sharp Shadows!

Now in valuable use with

HUNDREDS OF FOUNDRIES

IN ADDITION TO 400 RAILROADS AND OVER 300 CONTRACTORS.

REQUEST CIRCULARS FROM

The Wells Light Mfg. Co

EDWARD ROBINSON, Sole Prop.

40 Washington Street, NEW YORK.

MENTION THE FOUNDRY.

Improved Patent Sand Blast Machinery.

TILGHMAN'S PATENTS. MATHEWSON'S PATENTS.

For removing the Scale from Iron and Steel Plates, Cleaning Castings, Forgings, Etc.

By the use of common, sharp, dry sand, and with compressed air at from 10 to 15 lbs. pressure to the square inch to propel the sand, this Machinery will **CLEAN** all forms of castings (from the very largest weighing several tons to the smallest) **more thoroughly** than is possible by hand, at **half the total cost**, and in a space of time that cannot be conceived until the Machineryhas been seen in actual operation.

For small castings a Special Tumbling Barrel (as shown herewith) is used in connection with the Sand Blast Apparatus, where the Blast is directed through one or both ends of the Cylinder against the articles placed therein. The work being done by contact of grains of sand traveling at a high velocity, no portion of the surface of the castings can escape the action of the Blast, still in consequence of the slow revolutions of the Barrel and the shortness of the operation, the sharp outlines of the castings are well preserved.

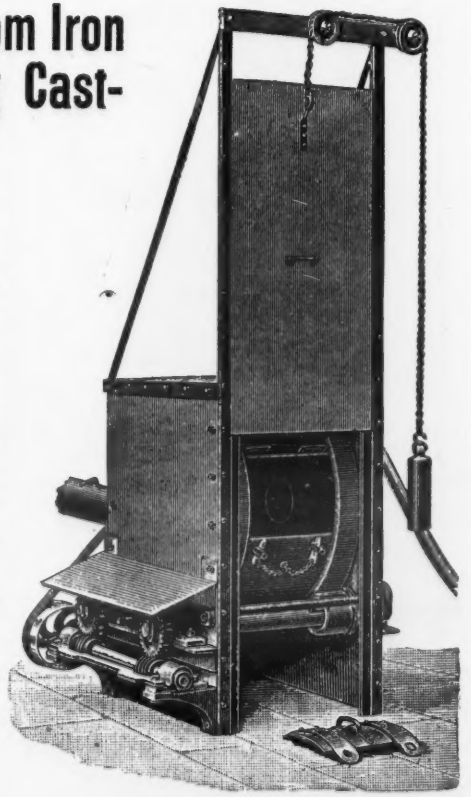
The Air Compressor and Air Tank used in connection with this Machinery are especially designed to supply, most economically and satisfactorily, the requisite amount of free air at the required pressure.

FOR FURTHER PARTICULARS, ADDRESS

WARD & NASH,

SOLE AGENTS.

23-25 PURCHASE ST., BOSTON 35-37 S. CANAL ST., CHICAGO



Barrel.

PIG IRON!

We represent Companies owning Sixty Blast Furnaces and are better equipped than any other house in the world to supply Pig Iron of all grades and qualities.

We also sell the best brands of Genuine Connellsville, Pocahontas and New River 72-hour Foundry Coke

BRANCHES.

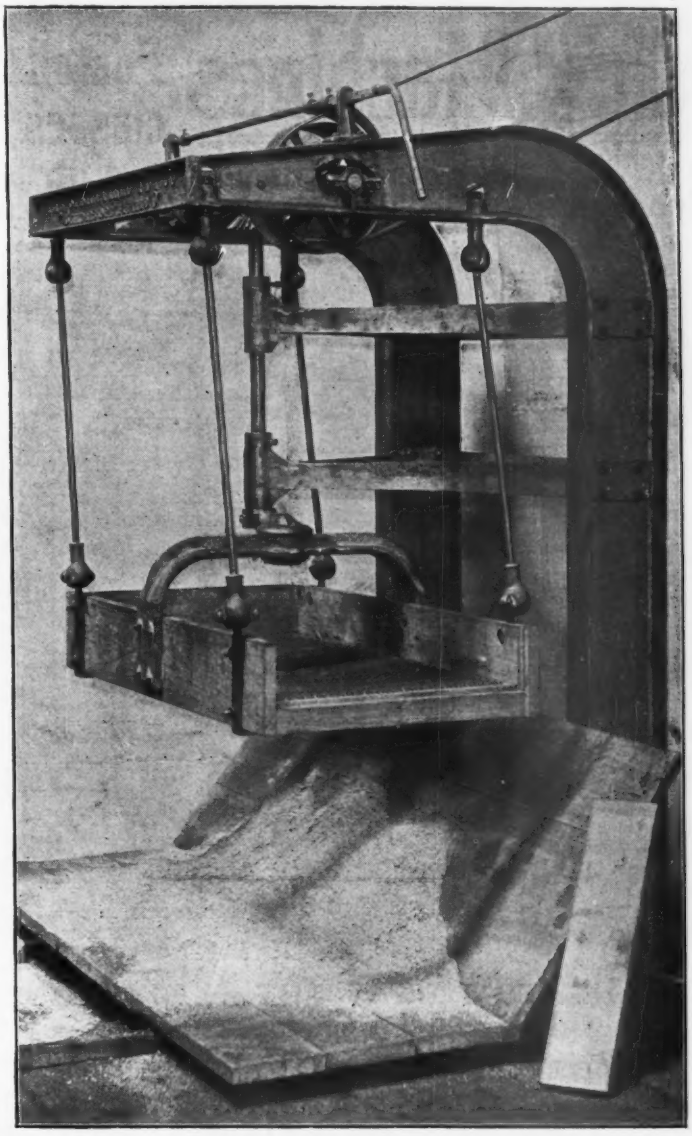
Rogers, Brown & Co., Buffalo—Resident Partner, Wm. A. Rogers.
Rogers, Brown & Co., New York—Resident Partner, Archer Brown.
Rogers, Brown & Co., Chicago—Resident Partner, M. Cochrane Armour.
Rogers, Brown & Warner, Philadelphia.
Rogers, Brown & Meacham, St. Louis.
Rogers, Brown & Co., Boston—F. G. Gibbs, Resident Agent.
Rogers, Brown & Co., Cleveland—Geo. K. Hosford, Resident Agent.
Pittsburg—H. M. Hooker, Resident Agent.
Providence, R. I.—M. J. Henehan, Resident Agent.

Rogers, Brown & Company

PRINCIPAL OFFICE

WM. C. HERRON, D. B. MEACHAM } Resident Partners.

CINCINNATI



A BOY will do the work of three men and riddle sand and facing enough for 75 or 100 molders.

It will pay for itself in a short time in any moderate sized foundry.

Built to Last. Easy Working. Dust Proof.

Riddles go with it, three of any size wanted.

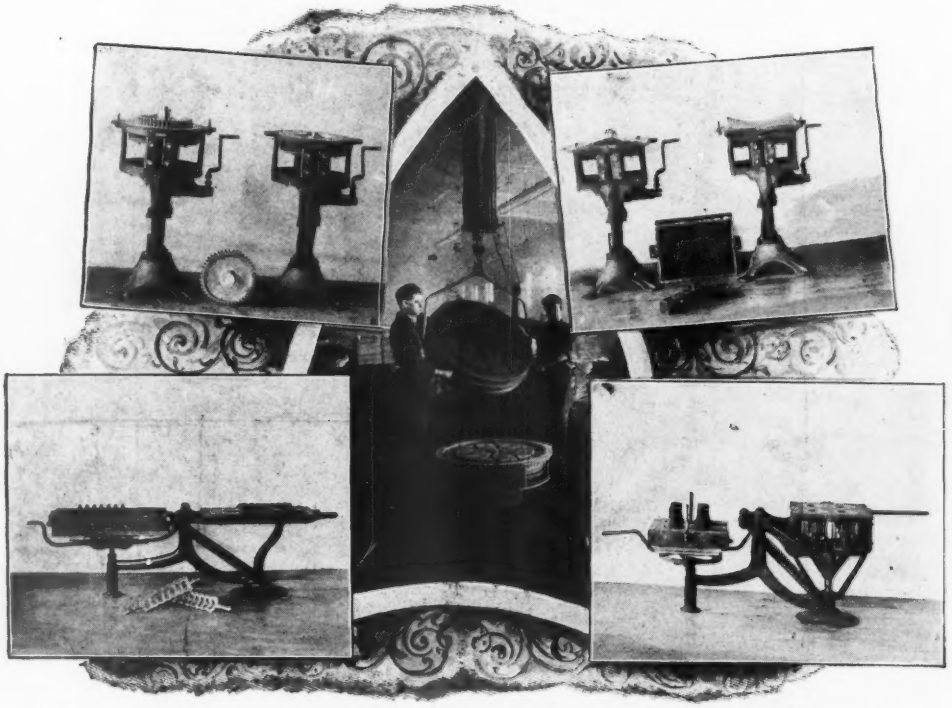
THE SPRINGFIELD FOUNDRY CO.,

EVERY MACHINE GUARANTEED. **SPRINGFIELD, OHIO.**

WRITE US ABOUT IT.

Molding Machines For all sizes and classes of work.

STRAIGHT DRAW,
ROCKOVER, AUTOMATIC DRAW ROCKOVER.



GUARANTEED TO PAY OUT IN SIX MONTHS
WHEN RUN TO THEIR FULL CAPACITY.

THE PRIDMORE MOLDING MACHINES

INSURE BETTER AND MORE UNIFORM CASTINGS.
LESSEN COST OF MACHINE WORK ON CASTINGS.
LIGHTEN THE LABOR AND SIMPLIFY FOUNDRY METHODS.
SAVE FIFTY TO SEVENTY-FIVE PER CENT.

Those having Castings to make in reasonable quantities, will do well to write for full information and lists of many foundries now using these machines. Estimates, prices, terms, etc., will be promptly furnished. Address

HENRY E. PRIDMORE,

111-113 W. HARRISON STREET, CHICAGO, ILL., U. S. A.

TRANSLUCENT FABRIC

A FLEXIBLE AND UNBREAKABLE **Substitute for Glass**

ESPECIALLY ADAPTED FOR

SKYLIGHTS

IN

FOUNDRIES, Machine Shops, Factories, Train Sheds Power Stations, Boiler Houses, . .

And in all places where the BREAKAGE OF GLASS constitutes an element of danger, annoyance and expense.

THE TRANSLUCENT FABRIC SKYLIGHT shown in the above cut forms the roof of the monitor on the Forge Shop of the Berlin Iron Bridge Co., E. Berlin, Conn. The skylight is 300 feet long and contains over 5,000 square feet of Translucent Fabric.

THE BERLIN IRON BRIDGE CO.,
EAST BERLIN, CONN., Oct. 2, 1895.

Translucent Fabric Co., Boston, Mass.:

DEAR SIRS:—Yours of the 30th is received and noted. Replying, we beg to state that we have found no inconvenience whatever from the yellowish light you mention from the skylight in our new forge-shop. When we first put on this skylight we were a little uneasy about the question of dust, dirt, smoke, etc., from our forges adhering to the under surface of the Fabric, but have found no trouble whatever from this source. We have made some experiments with the Fabric to see under extreme cases whether the soot and smoke would adhere to it so that it could not be removed, but have found that there will apparently be no trouble from this source. We took a piece of the Fabric that was left over from the skylight and exposed it directly to the smoke and soot (accompanied, of course, by more or less heat) direct from the forge fire, and found that while the soot would adhere to the Fabric, it was very easily removed, and apparently the Fabric was as good as ever after being washed as above noted, so that we have no hesitation in saying that in our opinion, the dust, dirt, smoke, etc., from forge-fires will not adhere to the Fabric to such an extent as to cause it any injury, even under the most exposed conditions. The more we see of the Fabric which we have in our forge shop, the better we are pleased with it. Yours truly,

CHAS. M. JARVIS, President.

TRANSLUCENT FABRIC is unaffected by extremes of heat and cold, expansion and contraction, storms, blows, variations in form of roof structure, etc. It is a non-conductor and will keep buildings warmer in winter and cooler in summer than glass will. For the same reason, the Fabric will not readily condense moisture. As the Fabric is flexible, joints can be made which will be absolutely water-tight.

SKYLIGHTS made of Translucent Fabric have all the advantages of glass skylights, while being entirely free from the many defects of the latter.

TRANSLUCENT FABRIC SKYLIGHTS cost much less than glass skylights, and are not a constant source of trouble and expense on account of breakage and leakage. Send for Illustrated Catalogue and Testimonials from those who have used Translucent Fabric.

Sole Manufacturers **TRANSLUCENT FABRIC CO.** Quincy, Mass.

W. H. COFFMAN COKE CO.

General Factors and Shippers of

POCAHONTAS

FLAT-TOP COKE.

BLUEFIELD, W. VA.

Our Foundry and Furnace Coke was awarded First Premium at the World's Fair in 1893

Comparative Analysis Report of Flat-Top and Connellsville Coke, by Dr. H. Wedding, Mineralogist for the Columbian Exposition.

FLAT-TOP COKE.		CONNELLSVILLE COKE.	
Moisture	.347	Moisture	.70
Volatile Matter	.757	Volatile Matter	.39
Fixed Carbon	92.552	Fixed Carbon	89.51
Sulphur	.597	Sulphur	.71
Ash	5.743	Ash	9. to 10.

In making this award, Dr. Wedding says, "I recommend an award for the following reasons: The Coke is of excellent quality for blast furnace and foundry purposes. It is hard and very strong. The cellular structure lets the gases into the interior of the Coke, and therefore, although it is porous, it bears heavy burdens. It is very resistant against abrasion, and contains only a very small amount of ash."

WE CHALLENGE the world to produce a coke that will analyze as high in fixed carbon and as low in ash and sulphur as ours. The physical condition is such that it is now carrying the heaviest burdens that are placed on any coke produced in the United States. Carbon is the only element in Coke which is expected to produce heat.

We have an average of 5 per cent. more carbon in our Coke than is shown by any Pennsylvania coke; therefore it should be worth 5 per cent. more on any delivered market, which is 20 cents per ton at any point where it costs $4 per ton delivered. Then a coke is more effective when not deteriorated with ash; and if it carries over one per cent. of sulphur, it is absolutely worthless for foundry purposes. It is now conceded by many practical foundrymen that **Pocahontas Flat-Top Coke** sold by us is worth for foundry purposes, at least 40 cents a ton more money on the $4 market than any other. All Iron industries are now coming up to a chemical basis. No more bad iron will be purchased and the fault charged to the coke.

The blasts and cupolas of the country are frequently arranged suitable for other coke than ours, and the cupola practice is different from what this Coke needs. We request that in the use of our Coke a large volume of air be used, with light blast; then charge the cupola according to the kind of iron desired. It has been conclusively demonstrated that it is not necessary to use anthracite coal in connection with our Coke, thereby reducing the cost of fuel to a minimum.

We ask all foundry foremen to give us a trial order, and try and not exhibit any prejudice in making this trial. We are very careful in the selecting and loading of any foundry Coke which we ship, and have succeeded in pleasing some 350 of the leading foundries in the United States. We have it melting over 11 to 1 of hot iron. We also offer for sale all sizes of Crushed Coke. Favorable freight rates. A folder showing how our customers use our Coke in Cupola will be sent with each bill. The genuine article is only made on line of Norfolk & Western R. R.

Correspondence solicited, when full information will be given.

DIRECTORY OF LEADING PIG IRON DEALERS.

HUGH W. ADAMS & CO.

Pig Iron Merchants

15 Beekman Street, NEW YORK

Boston Office, 85 Water Street

HENRY H. ADAMS & CO.

(Incorporated)

PIG IRON

Sole Agents for the Celebrated "NORWAY," for combined Strength and Softness.

177 Broadway,
NEW YORK CITY, N. Y.

MATTHEW ADDY & CO.

CINCINNATI, ST. LOUIS.

Agencies,

Chicago, Detroit, New York,
Philadelphia.

THE DOMHOFF & JOYCE CO.

PIG IRON COMMISSION,

CINCINNATI.

CLINTON IRON & STEEL CO.

Manufacturers of the

CLINTON INSPECTED FOUNDRY IRON

CELEBRATED "CLINTON" SOFTENER

PITTSBURG, PA

15 Cortlandt St., NEW YORK.

DAYTON COAL & IRON CO.

(Limited.)

PIG IRON.

DAYTON, Tenn. CINCINNATI, Ohio.

F. A. GOODRICH & CO.

Incorporated

PIG IRON, STEEL, COKE, ETC.

Detroit, Mich.

THE MARSHALL IRON

An old fashioned Pennsylvania Iron for high grade machinery.

The Juniata Furnace & Foundry Co.

Beach & Marlborough Sts.,

C. T. Holbrook, Sole Agent. PHILADELPHIA.

PICKANDS, BROWN & CO.,

Manufacturers, Importers and Dealers in

PIG IRON AND IRON ORE.

Rookery Building, CHICAGO.

ROGERS, BROWN & CO.

CINCINNATI, CHICAGO,

BUFFALO,

PHILADELPHIA, NEW YORK,

ST. LOUIS

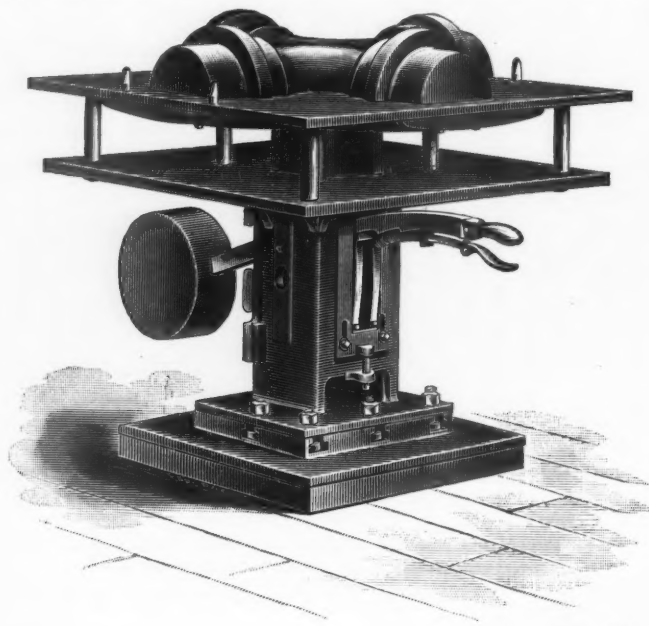
SLOSS IRON & STEEL CO.

BIRMINGHAM, ALA.

SLOSS PIG IRON

D. L. Cobb, Sales Agent

1145 Monadnock Block, CHICAGO, ILL

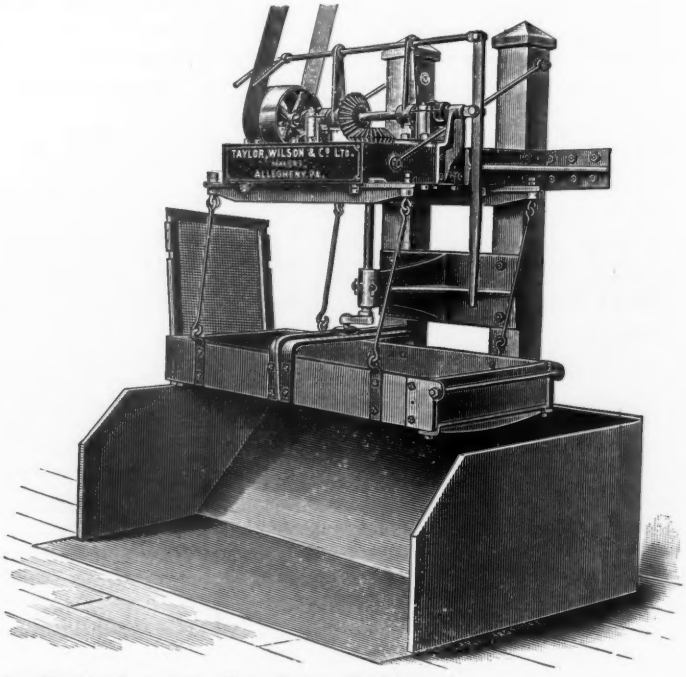


The Ideal Mould Forming Machine

ON this Unique, Labor and Money Saving Appliance, unskilled laborers make 300 Car Brake Shoes, or 38 Journal Boxes per day; as against 48 and 12 by skilled hand moulding, and the work is cleaner and more accurate.

No foundry where duplicate work is done, can afford to be without it.

The Cheapest and Best Sand Sifter in the Market.



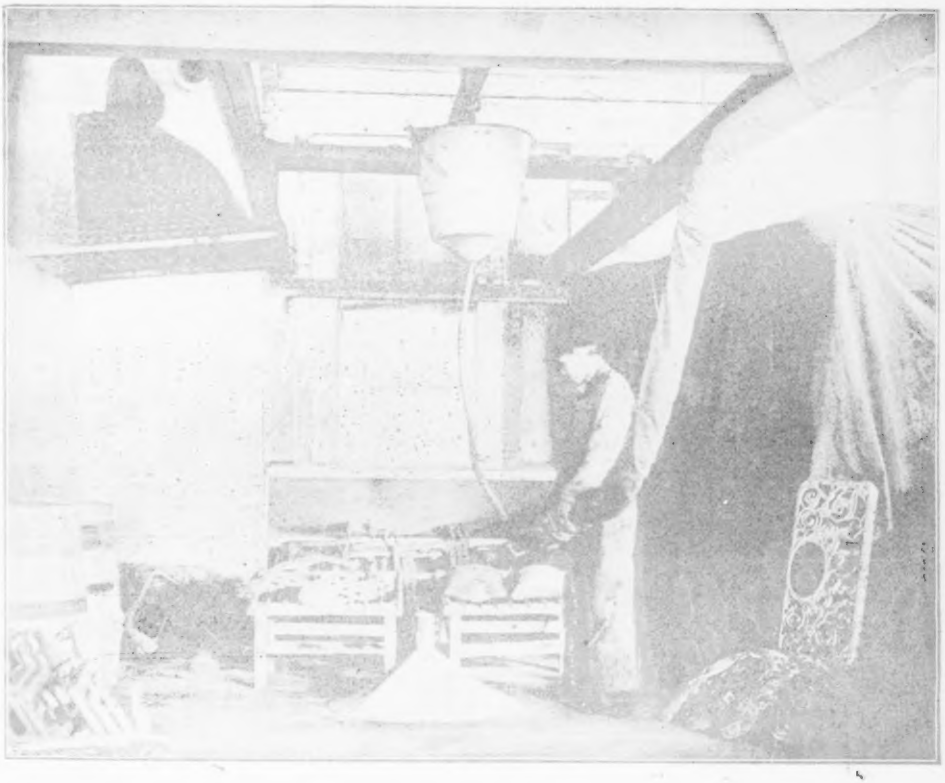
Write for Particulars regarding these machines to

Taylor, Wilson & Co., Limited,

GRANT AVENUE ALLEGHENY, PA.

THE GREATEST MONEY SAVER
EVER OFFERED THE
FOUNDRY TRADE.

..King's Patent Sand Blast..



Every up-to-date foundryman knows the value of a sand blast for casting cleaning purposes. If he does not he is behind the times.

The apparatus we furnish is the cheapest and best for either machinery or stove plate.

For cleaning Steel Castings it is invaluable.

Stove Castings cleaned by it can be placed directly in the nickeling bath.

Pays for its cost in one month.

PRICE, $75.00

F. A. GOODRICH & CO.

CHAMBER OF COMMERCE
DETROIT, MICH.

BEAMS
CHANNELS
ANGLES
BANDS
BAR IRON
STEEL RAILS
SHEETS
TANK STEEL
BOILER PLATE
TOOL STEEL
TIN PLATE
HOOP IRON
CHAIN

F. A. Goodrich & Co.

[INCORPORATED]

DETROIT, MICH.

Iron, Steel ....AND Coke

SOLE SALES AGENTS

UNION AND PENINSULAR

HIGH GRADE LAKE SUPERIOR **Charcoal Iron**

FOR CAR WHEELS AND MALLEABLE WORK

SOLE MICHIGAN AGENTS ...Lawrence and Globe...
...Ohio Softeners

Big Stone Gap, A VIRGINIA STRONG IRON

SLOSS—High Grade Alabama Iron.
SALSBURY—The Great Connecticut Charcoal Iron.
ROME—The Leading Southern Charcoal.

Peerless Sterling Scotch AND Iroquois of Chicago

STANDARD FOUNDRY GRADES.

CONNELLSVILLE COKE.

The Edw. P. Allis Co.

Milwaukee, Wis. have the largest foundry (exclusively for machinery castings,) in the United States. Its interior is shown by the following cut. . . . .

The daily melt is from 60 to 90 tons. All the heavy work is done under and handled by **THREE** thirty ton

Shaw Electric Traveling Cranes,

The first of which was put in operation in 1889, the second in 1891 and the third in 1893. Besides these, there are three more Shaw Cranes in the erecting and machine shops.

These Crane are Made Only by

THE SHAW ELECTRIC CRANE CO.

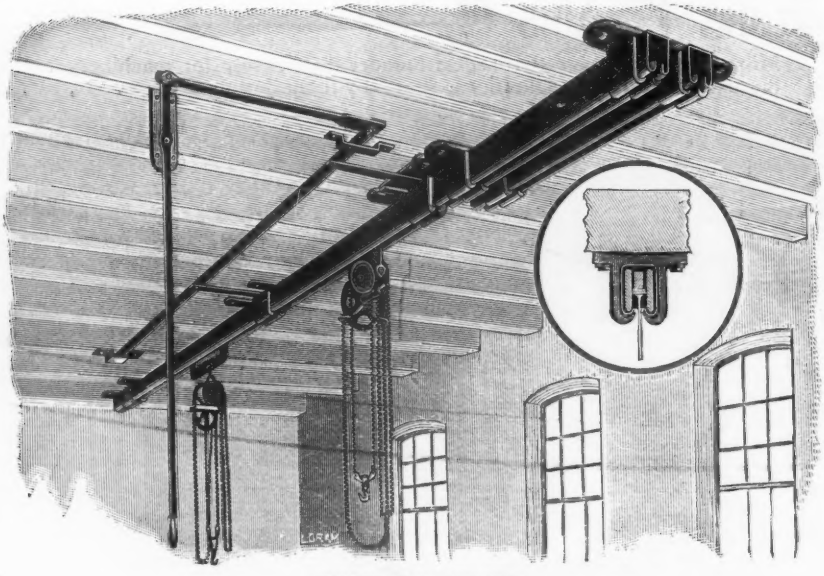
MUSKEGON, MICH.

——And Sold Only by——

Manning, Maxwell & Moore,

424 TELEPHONE BUILDING, PITTSBURG.

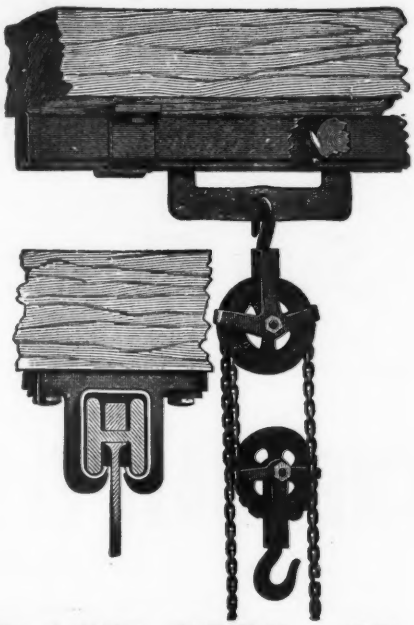
60 S. CANAL ST., CHICAGO, ILL. **111 LIBERTY ST., NEW YORK.**



THE PATENT

Overhead Trolley Track System

Is the coming improvement in the iron foundries of this country and in many cases can be made to pay for itself in a few months.



Just the thing for

Carrying Iron from Cupola to Floors.
Carrying Castings from Floors to Cleaning Rooms. . . . .
Lifting, Rolling or Moving Flasks. .

All who have adopted this system have expressed themselves as being delighted with it.

Write us for Circulars, Estimates and Full Particulars.

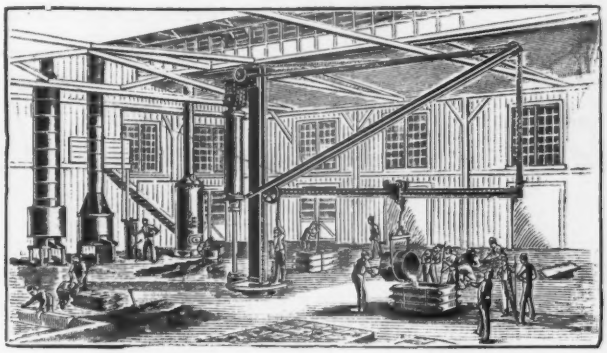
COBURN TROLLEY TRACK MFG. CO.

HOLYOKE, MASS.

WEALTH!!!

GRAB IT, MAN!

Just Suppose



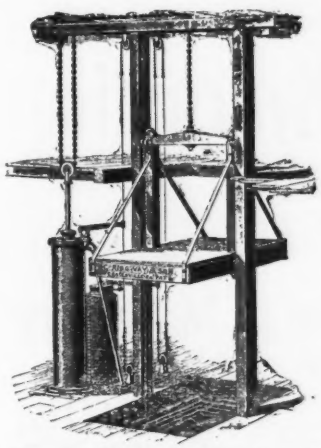
5-ton Steam-Hydraulic Crane in a Foundry.

THAT two of your present molders could turn out as much work as three are now doing, wouldn't you make money, even in these hard times? Of course you would. Well, here we offer you the . . . .

Ridgway Balanced Steam-Hydraulic Crane

which will enable your molders to do that very thing. We do not ask you to take our word for it—we might be prejudiced, as we have Cranes to sell—but we refer you to dozens of foundries who have the machines in daily use and you can go and see for yourself.

The Ridgway Crane is decidedly the most valuable machine ever offered to foundrymen. You often hear old experienced molders say what they could do if they only had an old fashioned hemp rope crane. You laughed at them, didn't you, and put it down as a piece of old fogyism. They are right, however. Well, here we give a power crane that has all the peculiar elasticity of the hemp rope crane and has, besides, so many other features that founders who have them don't hesitate to say



Steam-Hydraulic Elevator, also made direct acting with cylinder under platform.

That the same molders can do 50 per cent. more work with the same wages than with any other crane.

WE HAVE THE USUAL CIRCULARS

"PLEASE TAKE THE ELEVATOR"

Best Foundry
Cupola Hoist Known.

Craig Ridgway & Son,

COATESVILLE, PA.

JOHN J. SHIPHERD, Pres. W. RUSSELL, Vice-Pres. and Mgr.
L. C. SHIPHERD, Sec'y and Treas.

THE

Phoenix Iron Works Co.

The following is a letter which was sent to us unasked for and is a sample of many genuine indorsements which we receive very frequently.

OFFICE OF
BERT. L. BALDWIN, M. E.
CINCINNATI, O.

PHOENIX IRON WORKS CO.
CLEVELAND, OHIO.

GENTLEMEN—As you may remember, you furnished a 10 ton traveling Crane which was erected at the Cummingsville Generating Station for the Cincinnati Street Ry. Co. This crane was erected for the purpose of handling the heavy parts of the Railway Generators. The easy working of this crane was appreciated by the party, who had the contract for erecting the generator, who found that where it required eight men at the hoisting chain of one of our other cranes, it only required three at your crane, with both cranes handling the same load. All of the details on this crane are well worked out and substantial, so that I expect that it will continue to give us the best satisfaction.

Yours respectfully,
(Signed) BERT L. BALDWIN.

MANUFACTURERS

Hand, Steam, Belt, Hydraulic and Electric Cranes

FOR ALL PURPOSES.

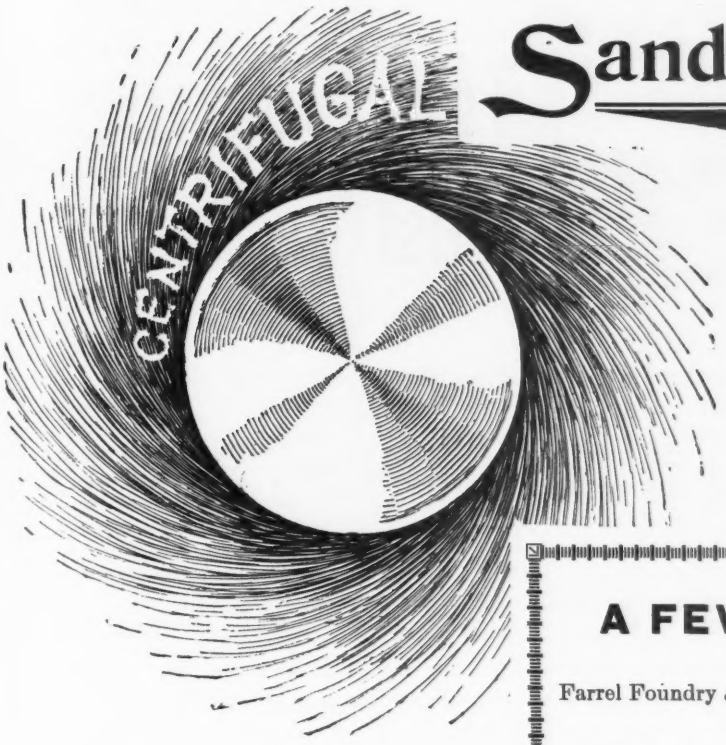
Foundry Ladles, Chains, and General Machinery

WASON STREET.

CORRESPONDENCE SOLICITED.
WRITE FOR CATALOGUE.

CLEVELAND, OHIO.

Eastern Office: HARRY W. JENNINGS, Agt., Fulton and Cliff Sts. NEW YORK, N. Y.
New England Office: THE JOHN WALES CO., 139 and 141 High St. BOSTON, MASS
CHICAGO OFFICE, 1430 OLD COLONY BUILDING.



Sand Mixer

IT IS

EFFECTIVE
EXPEDITIOUS
ECONOMICAL

IT SAVES

TIME
LABOR
MONEY

A new, simple and practical method of **preparing Sand for Molds or Cores,** superseding the old time methods of drying and riddling. Damp Sand is in just the proper condition for working.

The saving in labor alone soon repays the cost of the apparatus.

The Capacity depends entirely upon the facilities for feeding sand into the hopper, this may exceed 10 tons an hour. Two men will easily shovel 5 tons an hour by hand into the machine. One handling is, in ordinary work, all that is requisite.

A FEW USERS:

Farrel Foundry & Machine Co.,
Ansonia, Conn.

Westinghouse Air Brake Co.,
Wilmerding, Pa.

I. P. Morris & Co.,
Phila., Pa.

McConway & Torley Co.,
Pittsburgh, Pa.

Deane Steam Pump Co.,
Holyoke, Mass.

Erie Malleable Iron Co.,
Erie, Pa.

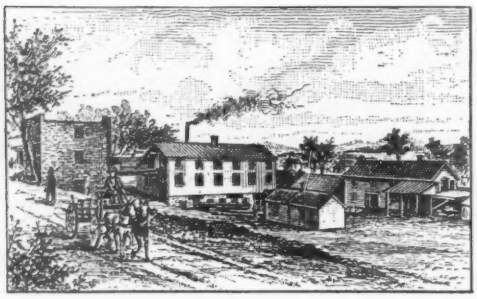
E. Chicago Foundry Co.,
E. Chicago, Ind.

Maher & Flockhart,
Newark, N. J.

} Machines now building.

William Sellers & Co., Incorp.

PHILADELPHIA.

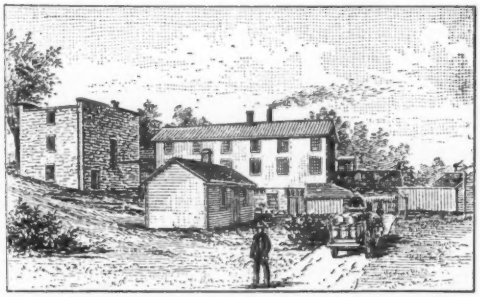


This Property Must be Sold!

In order to settle up an estate, we offer this first-class

Foundry and Machine Shop Plant

at less than quarter its actual worth. The plant consists of the following: Machine Shop, 36 ft. x 60 ft., three stories high, with complete equipment of Iron and Wood Working Tools and Machinery. Foundry, 60 ft. x 80 ft., with first-class equipment in every way. Fire proof Pattern Building, 30 ft. x 30 ft., three stories high, containing a very large stock of most desirable and valuable patterns. Blacksmith Shop, with all Tools. Store House Building. Japanning Building and Office Building. Both Steam and Water Power. Located on West Shore Railroad and Erie Canal, 8 miles from Syracuse, N. Y. This is just the plant for manufacturing Hardware Specialties.



. . . **For full information, address** . . .

The Estate of Huntington Beard,

FAYETTEVILLE, N. Y.

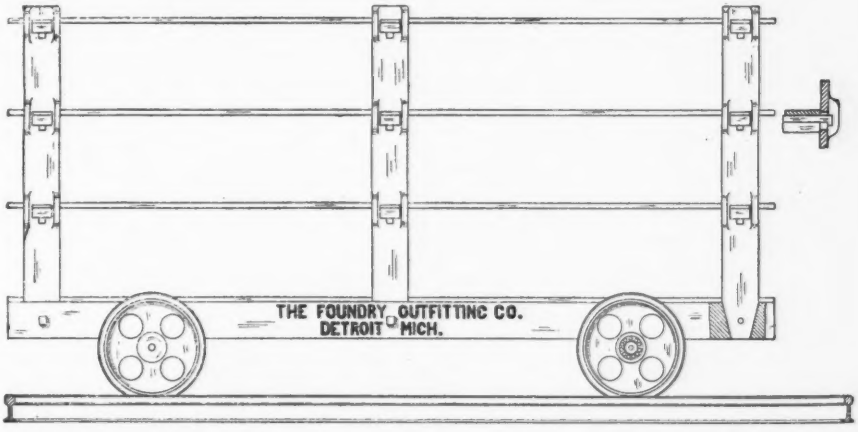
Cupola Furnaces
Blowers
Cranes
Compressors
Hoists
Elevators
Foundry and
Core Oven Cars
Ladles
Reservoirs

Core Oven and Foundry Cars

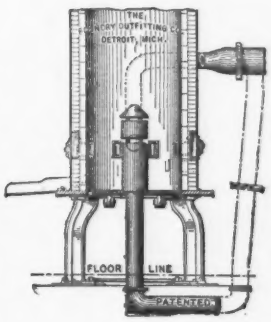
OF
EVERY
DESCRIPTION.

Furnished with anti-friction Roller Bearings. Give them a trial, and you will never use the old-fashioned oil bearings.

While you are thinking about good things do not forget the best Cupola on earth.



Tumbling Mills
Core Ovens
Sand Sifters
Brass Furnaces
Testing Machines
Trolley Tracks
Foundry Lights
Flasks
Fire Brick
Fire Clay
Molding Sand



The "**CRANDALL**" with **Johnson's Patent Center Blast** attachment, uses only one-quarter as much blast as all old style cupolas. The Brick lining will last four times as long.

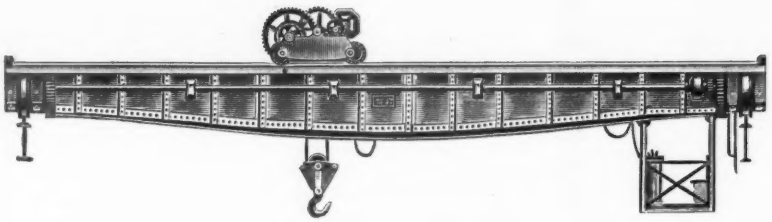
The saving in fuel alone will pay for original cost in a very few months. Can be placed on any style cupola.

Lots of orders on our books.
Write for circulars.

The Foundry Outfitting Co.

DETROIT, MICH.

CUPOLAS **LADLES**



Compressed Air Cranes

Three Motor Air Cranes.
Two Motor Air Cranes.
Direct Acting Cylinder Air Cranes,
Jib and Traveling.

Electric Traveling Cranes.

Hand Power and Steam Power Cranes
of all Types and for All Purposes . .

Improved Air Hoists

Complete Equipment for Foundries.

SEND FOR CIRCULARS AND PRICES.

Whiting Foundry Equipment Co.

DESIGNERS and MANUFACTURERS,

1522 Monadnock Block, CHICAGO, ILL.

TUMBLERS **TRUCKS**

THE FOUNDRY

VOL. 7. DETROIT, MICH., APRIL, 1896. No. 44

Iron Foundry Buildings.

BY O. BENSON, C. E.

The use of cranes makes it necessary to provide a strong and well braced building; a wood frame, aside from the danger of its burning, always warps and shrinks, the truss joints pull out and things are thrown out of line generally; in fact an attempt to construct a wood frame building or roof sufficiently strong and well braced for the use of cranes having a capacity of ten tons and upwards, is not likely to give very satisfactory results. The small additional cost of steel construction is more than offset by greater safety and better results obtained.

In constructing a new plant the probable cost of insurance is sufficiently important to demand careful consideration. The usual cost of insuring foundry with wood frames ranges from one and one-half per cent to three per cent., depending on location and general arrangement, whereas a foundry building constructed of non-combustible materials need not be insured at all.

Assuming that money can be had at seven per cent., we would be justified in adding to the cost of our building a percentage of the amount for which we would otherwise be insured equal to 1 1-2 divided by 7 equals 21 3-7 per cent. for a premium of 1 1-2 per

Fig. 1—Interior of Modern Pipe Foundry with Square Pits.

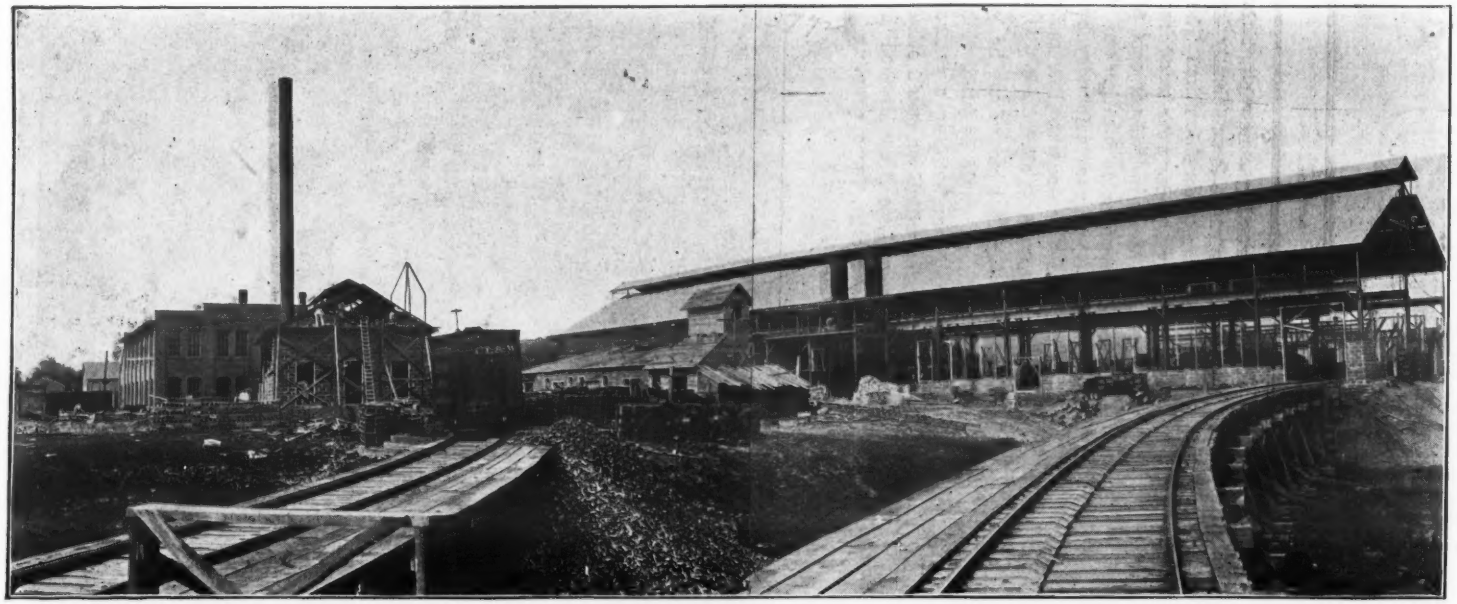


FIG. 2—VIEW OF MODERN PIPE FOUNDRY WHICH CONTAINS SQUARE PITS AND USES TRAVELING CRANES, INSTEAD OF USUAL STYLE OF CIRCULAR PITS WITH JIB CRANES.

cent. and 3 divided by 7 equals 42 6-7 per cent. for a premium of 3 per cent. If then we would have to carry say $50,000 insurance on a wooden structure and contents we might reasonably add $10,700 to $21,400 to the cost of our structure and feel that the money is well invested, provided we avoid the necessity of carrying insurance, as an illustration: The interest on $10,700 at 7 per cent. would be the same as 1 1-2 per cent. premium on $50,000, namelyfi $750. Moreover, it is well known that the sum awarded by insurance adjusters seldom covers the cost of property destroyed, to say nothing of the delay in business and loss of customers while a plant is being reconstructed—all of which is actually a part of the risk assumed in a building constructed of combustible materials. Even when it is thought desirable to carry insurance on a steel frame structure, it does not cost over ¾ per cent. on building and contents. The modern tendency seems to be in the direction of fire-proof construction with no insurance, where the material sheltered is not itself very combustible.

In view of the above facts it can nearly always be demonstrated that a fire-proof or non-combustible foundry building is the cheaper.

The increasing use of steel in the construction of buildings has induced a number of companies to make a specialty of such work. Of these the leading concerns always employ competent engineers to design their work on thoroughly scientific principles, each problem in construction must be studied with care although the time allowed is often very short; for on the one hand sharp competition makes it necessary to keep the cost down, while on the other reputation must be carefully guarded, for a failure due to defective construction would give rise to a large amount of very undesirable advertising in a remarkably short space of time.

Being provided with exact information as to cost and behavior of a large number of

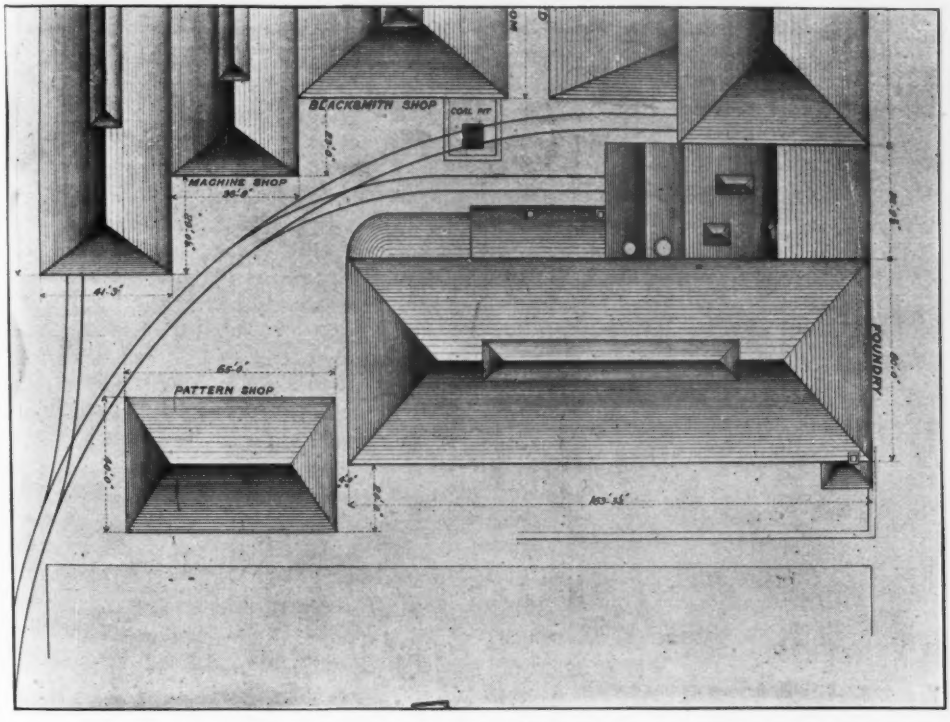


FIG. 3—ROOF PLAN OF YORK MFG. CO.'S FOUNDRY, YORK, PA.

structures, these concerns are able to furnish estimates on the best possible construction at the lowest possible cost, and usually do not hesitate to design and construct buildings complete for an entire plant, even where a good deal of material other than structural steel is required.

Plate 1 is an interior and plate 2 an exterior view of some pipe foundry buildings recently designed and constructed by the Wrought Iron Bridge Company. Pipe is here cast in straight pits about one hundred feet long, one on each side of the building as shown in plate 1. Two rows of flasks are set in each pit resting on flues from which heated air is forced up through them to dry the molds. Flasks, cores and pipe, as well as ladles used in pouring the metal are handled by ten ton electric traveling cranes, of which there are four, two on each side of the building; these run along the rails and girders shown and command a space of 312x75. Two of these traveling cranes may be seen in plate 2 near the right-hand side. This arrangement of plant is said to possess decided advantages over the common method of casting pipe in a circular pit, using jib cranes. There are no ovens in and out of which flasks must be lifted to dry the molds and no awkward transferring of flasks, ladles, etc., from one job to another, so that a considerable economy is effected, made possible largely by the use of traveling cranes.

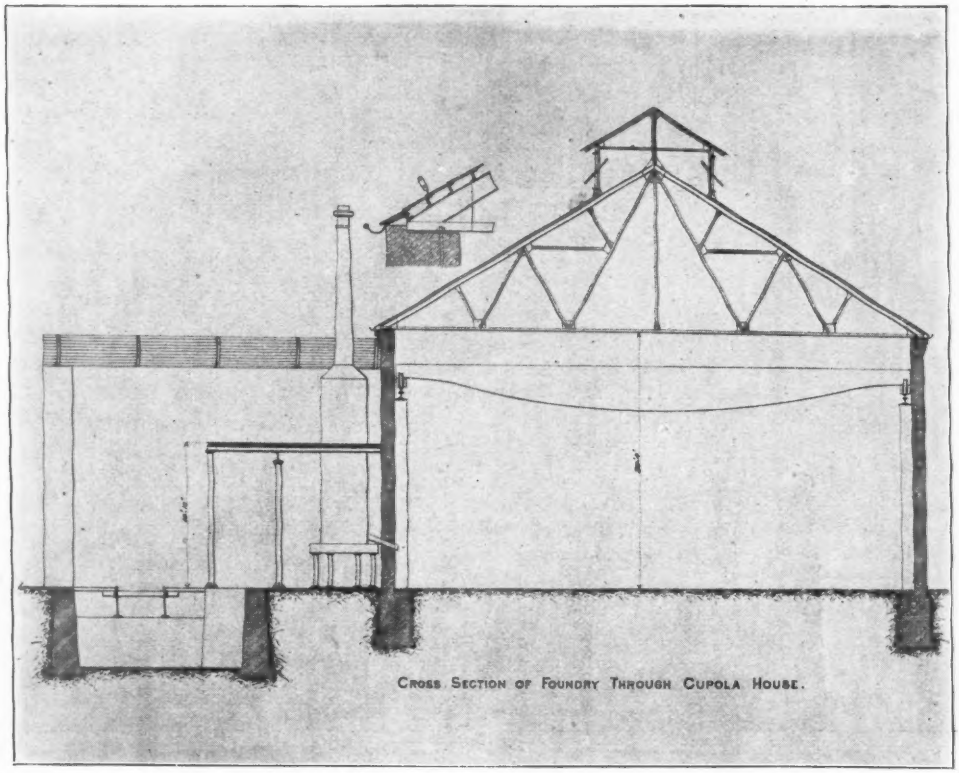


Fig. 4—Section of Roof York Mfg. Co.'s Foundry, at York, Pa. showing Cupola and Traveling Crane.

The charging floor is constructed of plates laid on steel beams.

The roof of foundry building shown is covered with matched sheeting secured to steel purlins, with slate laid on top. Experiments made by the Factory Mutual Insurance Company and others show that the flat surface of boards laid close together like the sheeting of this roof, will not burn. There are no corners

and angles about which air may form eddys, bringing up oxygen to feed the flames and carrying away products of combustion. Fire simply chars a flat surface, forming a thin layer of carbon which cuts off the supply of air and protects the wood beneath.

The outer columns are inclosed with a wall of hollow building blocks. These blocks are made from clay similar to that used in the paving bricks for which Canton, Ohio, is famous, burned very hard and glazed.

Walls of this material do not readily admit either heat or moisture. All walls were built by The Ohio Hollow Block Company.

In the background, to the right of plate 2, may be seen the frame of a long narrow building, where pipe is coated with coal-tar, weighed, tested and loaded for shipment by means of another traveling crane.

Plate 3 shows the roof of a foundry which is a part of the York Manufacturing Company's plant at York, Pa., and plate 4 shows a section of the same. A twenty-five ton electric crane commands the entire floor space of the main building. Cars may be run in at one end from a turn-table in the boiler shop adjoining. Coke is dumped into a pit shown in plate 4, from which it, together with metal to be melted, is lifted to the charging floor by means of an elevator. This charging floor is very strongly built and covered with four inch steel eye-beams set close together, the idea of Mr. J. A. Dempwolf, architect. The roof is slate fastened to steel purlins with copper wire. This makes an excellent roof which is, of course, fire-proof. Although rather expensive, they have built a number of similar roofs, mostly for gas retort and producer houses.

They are furnishing the steel framework of roofs like this for the York Manufacturing Company, covering approximately 67,000 square feet.

Pivoted windows in the side of ventilators are operated from the floor by means of a mechanical device not shown in the drawings, which otherwise explain themselves.

The Growth of Foundry Literature.

BY THOS. D. WEST.

In complying with the request of the Editor of THE FOUNDRY to review briefly the recent growth of foundry literature and tell something of my own experience in writing, my first thoughts revert to the forces that lent encouragement to practical writers to rebut the ridicule with which their work was often met.

When we consider the general character of newspaper articles and publications that existed previous to about 1878, purporting to advance the knowledge of mechanics, we cannot censure those who then ridiculed the idea of trade literature being of any particular value to the tradesman; for, as a rule, an author at that day was encouraged to write a book on almost any subject that fancy might direct, could they but write fluently and in good form. The author who would write on How to Build a House, do Blacksmithing or make a Watch, was thought competent to launch a work on Founding. The result of this was, that when a practical man read a few lines of that kind, he became disgusted at the assumption and ridiculed the idea of anyone hoping to be benefited by literature purporting to give any knowledge of the fundamental principles involved in the trade. For this reason the pioneers of practical literature did not find their appearance a path lined with roses, but, instead of this, found that courage and perseverance were the qualities needed to sustain them in their work. As articles gradually appeared from the pen of practical men, supporters were found among the most intelligent and skilled men of the trades to encourage the good work. The radical difference which existed between the bosh of "all-round mechanical writers" and the practical specialist very soon placed the former in the rear, and with the aid tendered by appreciative minds caused rapid strides in a general recognition of the value to be attached to articles and works from practical men, until today, I question if there can be found a man, however illiterate, that would attempt to deride the sterling value of practical foundry literature.

The first works of practical value published on iron founding were those of Dr. Edward Kirk, treating the subject of melting iron and cupola practice, followed by a small, but most excellent work, by Mr. Claud Wylie, a practical molder of Sunderland, Eng., treating questions involved in "loam" and "green sand" molding . After this came a work by Mr. N. E. Spertson, a mechanical engineer of London. I had

been writing some time before I was aware of the existence of these excellent books, and when I obtained them, in 1882, new courage stimulated my own efforts, as they stood out conspicuously as showing the value of the assistance to be derived from studying the writings of others on any subject in which the writer had himself personal experience.

The first article I wrote appeared in the "American Machinist, January 15, 1881. As the circumstances connected with this introduction of my first attempt at writing may influence others who are now too backward to make a similar attempt, I will take space to recite them. There is one thing about practical literature, no matter what subject may be discussed, it almost invariably displays shop experience and presents something that can be practically applied to benefit some one in the business. It was this thought that caused me to yield to solicitations from my friend, Mr. John Doolittle, a machinist, to commence writing, and send an article to the "American Machinist," he seemed to think I would be successful, owing to the character of the sketches and notes he observed I had collected in my travels, of shop wrinkles, receipts, etc. Soon after mailing my first article to the "American Machinist" it appeared in a very attractive form, covering the whole of the front page. I was not prepared for such an introduction. I felt I wanted to commence, if such was to be, in an unattractive manner. I always started in at the back when watching for the article, and when I saw what greeted my gaze in the number containing it, I gave the paper a fling from me with feelings of embarrassment, criticism, responbility and gratification all intermingled in such confusion that I did not attempt to read the article, but straightway hunted up my friend Doolittle, to tell me what he honestly thought of it, as I held him responsible for getting me into the dilemma I felt that the prominence of the article had placed me in. "Why," said I to John, "I have not anything more to write about and such publicity will cause them all to be chasing me up and bothering the life out of me. I shall never forget his reply, which was an order for me to go home, open my sketch box, use my brains, and let him see an article from me every week or two, or else he would disown me. If, at this time, any one had told me I would, a few years later on, be the author of two standard works and have others in contemplation, I would have thought them a fit subject for an asylum. This incident forcibly illustrates how we can often surprise ourselves, and that it is not so much what we know, as what we may achieve by reason of study and a little use of our brains, if we wish to successfully accomplish our undertakings.

There is nothing that will let a man realize what he truly knows about a subject, so much as to sit down and try to write his views and experiences, with a knowledge that if he lets it go out of his hands people all over the world may be his audience to criticise, commend or condemn. It is a very simple matter for a man to express his views and experiences in the shop and take to himself credit for being correct, but let this same fellow place his expressions on paper to be put in cold type for general publicity, he will find shop talk and writing two different things, and the latter will often make him change his theories or ideas, owing to the simple fact that writing an article on a practical or mechanical subject causes a man to reflect as to the merit of the ideas or plans he may be advancing, and as a result he is led into studying the matter in all its bearings, and unconsciously begins a degree of research he otherwise would not have thought of.

After the first appearance of two or three original articles from my pen, one appeared almost every other week for about three years. I noted at the start from personal letters and trade paper comments that great interest was being awakened in practical foundry literature, nothing of any moment having appeared previously in any of our trade papers. This, of course, was very gratifying, and I was more encouraged to do my best. Before I fully realized where I was drifting, John Wiley & Sons, the eminent book publishers of New York city, requested me to compile my work in book form. As I had stopped considering what I might not do, I signed a contract with the Wileys to comply with their request.

Being always anxious to encourage any one to write on this subject. I soon found an earnest co-worker in Robt. E. Masters, now manager of the Marshall Car Wheel & Foundry Co., of Marshall, Tex., and who is to be credited with having played no small part in aiding the good work. After the appearance of Mr. Masters soon came Mr. Simpson Bolland, who, after compiling three practical and valuable

works, which appeared in the years 1892, 1893 and 1894, seems to have retired from the field.

Commencing with the year 1889, the foundry world's attention was attracted by the appearance of the Machinery Moulders' Journal, edited by Mr. John A. Penton. The rapid strides which this journal made in securing original, practical and valuable literature was soon a subject of universal comment. It was a great surprise to many when, in September, 1892, he launched "The Foundry." While the ultimate success of his venture may have appeared doubtful to some, at first, such ideas were soon dispelled in the minds of any who have watched its progress.

It was with much delight that I hailed the appearance of this journal, for the foundry trade stood greatly in need of an independent paper to advocate and advance its interests, and its present popularity fully proves that the field existed and is being well filled.

The introduction of "The Foundry" as an independent paper soon suggested the idea of founders having an independent Association. This idea was discussed for some little time by the Philadelphia foundrymen, and, largely through the efforts of Mr. Howard Evans, the organization known as the Foundrymen's Association was started at Philadelphia in July, 1891, with Mr. Evans as secretary. Shortly afterwards, and largely through the initiative of Mr. A. I. Findley and the Whiting Foundry Equipment Co., the Western Foundrymen's Association was organized at Chicago, in May, 1893. The secretary, Mr. B. M. Gardner, and his successor, Mr. S. T. Johnston, have both done very commendable work in their efforts to obtain good papers and assist the other officers in pushing this organization to the front.

The success of the Eastern and Western Foundrymen's Associations has encouraged the idea of forming a national association of foundrymen, a meeting for that purpose being now called, to convene at Philadelphia this coming May, 12, 13 and 14. This meeting should result in benefiting the trade generally, and I trust it will not disband without first forming a permanent organization to have jurisdiction over subordinate sections and facilitate the rapid formation of branches all over this country. The good work such an association could do in assisting founders generally to obtain a living price for their castings, and retard the ruinous competition found all over this country, as well as establishing other reforms, cannot be over-estimated.

A study of the progress which has been made since the advent of practical foundry literature and the formation of independnet foundrymen's associations seems to indicate that this national association, if properly formed and managed, is the one thing needed to place the foundry business in the position it is entitled to occupy considering the wealth, intelligence and skill now invested and engaged in it.

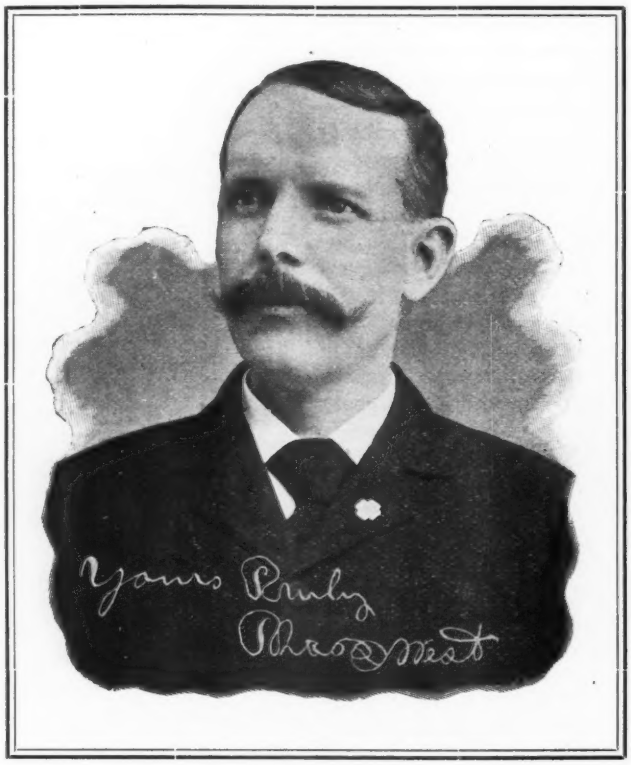
The late reforms in utilizing chemistry to aid in obtaining desired mixtures of iron is a work to be largely credited to the influence of association work. While these associations have done much good during the short period of their existence, we have every reason to believe their future labors will be still more beneficial in aiding to bring about reforms which are greatly needed in other departments of foundry work. The question of having blast furnaces adopt reliable systems for thoroughly mixing their "casts" before iron is shipped, also the adoption of some uniform method of physical tests to admit of universal comparison, combined with the inauguration of a national apprenticeship system, are all subjects which the present power of the associations can bring to a successful issue, as well as the arranging of means to settle all disputes between employers and employes, as is now done by the stove foundrymen. After these reforms are enacted, there is no reason why we should not expect from the present energy displayed, very beneficial results in association work, retarding the ruinous competition now existing, and permit all to obtain something like a living price for their castings.

I have not attempted to treat in detail all or nearly all the benefits which have been secured through the influence of writers on foundry subjects and association work for the employe as well as the employer. I have simply treated the subject in a general way to show the progress that has been made in the last fifteen years, and that we have as good cause to expect benefits and reforms in the future as in the past; and finally to see the art of founding recognized by all as a trade entitled to the highest place in the mechanical world.

Thomas D. West.

Those not acquainted with Mr. West or his history are apt to think he is a very old man. That such is far from being the case is amply shown by our illustration made from a photograph taken in November, 1895, only a few months ago.

Something about his literary work, however, is apt to cause a stranger to think that he must be well advanced in years, and a story is told of a gentleman long connected with a well-known trade journal, for which Mr. West had contributed, always referring to them as "another article from the old man."



It is not generally known that Mr. West served a regular apprenticeship of six years on heavy machinery and jobbing work, and at an early age commenced work as a journeyman molder in New York city at the Morgan Iron Works Foundry, then managed by John Roach, the well-known ship-builder. Leaving here he traveled about for a time, working in many well-known shops in the Eastern and Middle States, landing in Cleveland in 1871. Mr. West's skill as a molder, especially on heavy work, led Thos. Manning & Sons, of Cleveland, to offer him a position in charge of their foundry, which he accepted although but 21 years of age. His success in that capacity brought him some reputation as a foundryman and his services were sought for by others. As a result of this he had charge within the period of eight years of the foundries of Wm. Tod & Co., at Youngstown; William Fitzsimmons & Co., and the Variety Iron Works, at Cleveland, Ohio. Mr. West's success attracted the attention of Mr. J. F. Halloway, the well-known mechanical engineer, then president of the Cuyahoga Steam Furnace Co., and as a result he was shortly afterwards placed in charge of the Cuyahoga foundry, the best in Cleveland, or that part of Ohio, at that time, and engaged in a line of heavy engine and machinery work. Mr. West remained here under Mr. Halloway for a period of six years, and left a record behind him in the way of

small number of castings lost that was said to be phenomenal.

In leaving here to start in business for himself on the eve of March 19th, 1887, he was presented with a handsome gold watch by his employees as a token of their esteem. Mr. West first started in business in company with two other practical men, one a molder and the other a patternmaker—their combined capital amounting to about $4,000.

This, of course, did not permit of anything very elaborate in the way of equipment or buildings, as much of it had to be reserved the capital necessary for carrying on the business. Foundrymen in Cleveland and elsewhere, who were familiar with Mr. West's literary work, naturally expected, when visiting their shop, to see something superlatively fine, and forgot, in their disappointment, that all such things cost money, and oftentimes a good deal of it. A modern crane alone in these days, costing more than this entire plant.

Hence Mr. West has been sometimes criticised and has felt, perhaps, the injustice of it. At the beginning the shop over all was 50x60 feet; by reason of good management and hard work this was extended in about three years to the length of 300 feet, one of the largest shops in the city of Cleveland, which has always been noted for the sharp competition existing among its foundries.

On January 13, 1892, their shop burned to the ground and the firm seeing a good opportunity to advantageously change their location, removed to Sharpesville, Pa.

They now have a large iron foundry well-equipped with the power cranes and machinery to economically manufacture their castings, and when business is at all good, melt from 40 to 70 tons per day.

The pin shown on the lapel of Mr. West's coat is that of the American Society of Mechanical Engineers, of which he has been a member since 1884, having been proposed by his old employer, Mr. Halloway. Mr. West takes much interest in its proceedings, especially that portion having reference in any way to cast iron.

He has contributed several papers to its proceedings and has written extensively for the Iron, Steel and Mining Engineers' Institutes, also for the Eastern and Western Foundrymen's Associations, being an honorary member of the former and an active member of the latter.

It is almost unnecessary to say here that he is, however, best known as the author of two standard works, viz.: "American Foundry Practice" and "Molders' Text Book," which are to be very generally found on the desks or tables of foundrymen everywhere. Mr. West has had severe critics at various times, but the man without them never attains any great prominence, and much less shows any remarkable individuality. All must, however, agree that his two books were entirely his own work, and reflected the result of much labor, and as the pioneer in America in what has since grown to be, an important subject, he must forever be given much credit. For a man only 44 years old he does not appear much the worse for wear, and The Foundry trusts he may be spared to us, and his ideas realized concerning the proper appreciation of the importance of the foundry business and all connected with it.

How I Improved a Foundry.

BY S. GROVES, M. E.

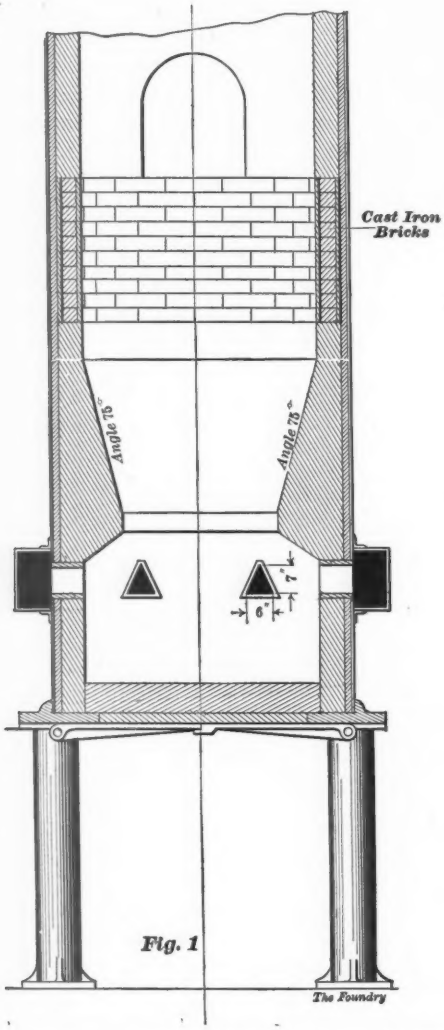
III.

"We judge ourselves by what we feel capable of doing, while others judge us by what we have already done."

—*Longfellow.*

Having overcome the difficulties experienced with our larger cores, by altering the existing core oven, on the lines illustrated in the January number, I straightway turned my attention to the cupola, which had been giving trouble daily. When anything like a heavy heat was being taken off, the shell around the zone of fusion, would be red hot on the one side, and comparatively cold on the other; for, the seven oblong, horizontal tuyeres—5½ inches long by 3¾ wide, and 2 feet 1¾ inches from bottom plate—were ranged close together on the hot side, and must have been laid off with a broomstick instead of a standard rule! Thus ludicrous arrangements, together with the erratic, defective, fan blast, was a constant cause of dull iron, and the use of the sledge hammer and crow bar. To make matters worse, the cupola man began to disorganize his brain centers with a well-known narcotic—acrid poison. I, therefore, stepped on board a train, traveled over 100 miles, and returned in 24 hours, having engaged one of the best cupola workers,

that ever mixed metal, gave molders hot iron, or helped them to pour off their floors early. Then, I prepared a design (Fig. 1) for relining, altering the tuyeres and otherwise remodelling the existing cupola. This design was accepted. And since it embodies

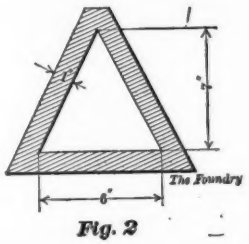


SECTIONAL VIEW OF CUPOLA AFTER ALTERATIONS.

one or two heterodox ideas, I conceived that it might, perhaps, interest readers of THE FOUNDRY if I stated briefly the reasons which actuated their adoption.

Every Foundryman in America who can get away should be in Philadelphia May 12, 13 and 14.

The charging hole was in a deplorable condition: the hood being burnt off completely, also about 12 inches of the shell, while the only protection was a huge slab of metal, suspended on an attenuated rusty wire. I threw the slab on the scrap heap, rivetted a new plate around the tattered hole, put on a cast iron frame, and pair of hinged doors lined with fire brick. This served the purpose, but I regretted afterwards that I did not substitute a light wrought iron frame, covered with wire gauze. I mentioned this device to a sceptical core maker one day, and shall not soon forget his astonishment, after he had walked up to a hot coke fire, with a riddle before his face! Having fixed up the charging hole, and repaired the roof over



SECTION OF TRIANGULAR TUYERE.

the staging, we then cut out the tier of burnt plates about the tuyeres, and substituted a new one: to which we attached six triangular tuyeres (Fig. 2), regularly spaced around the circumference.

By this method, preventing the chilling effect of the cold blast upon the molten metal dropping from the zone of fusion above the tuyeres; and, accomplishing the devised economy of an effective center blast. The modus operandi is as follows: Whilst the oxygen of the knife edged blast at the upper part of the tuyeres is undergoing the process of conversion into intense heat, by chemically combining with the carbon of the incandescent fuel, to form carbonic oxide; and is gradually cutting its way up the face of the overhanging arch, to the throat of the crucible; the greater portion, or volume of the blast, entering the crucible at the lower part of the tuyeres, is passing through a like process, and by concentration of the developed heat—aided by the natural draft of the stack—cuts its way upward to the center of the melting zone, where the major portion of the molten

metal is precipitated through this column of carbonic oxide, to the hearth below—settling there, in all its integrity.

Having had over twenty years around the blast furnace, I remembered that sometimes a supplementary casing was placed around the bosh shell, lined with coarse gravel, to allow for displacement, when the lining swelled owing to expansion. Moreover, I had seen this expansion cavity tried in a 54-inch cupola some five years previous, with conspicuous success, consequently we allowed a space of 1¼ inches between the wrought iron shell and fire brick lining. Not having coarse gravel or mineral wool at hand, we were constrained to fill the space with floor molding sand instead. Then we took into account the fact that the lining immediately below the charging hole is subject to considerable wear and tear, owing to the chipping of the fire brick faces, caused by the throwing in of the metal pigs and scrap. We therefore prepared 10 tiers of hollow tongued and grooved cast iron bricks (Fig. 3), which were to be rammed hard with black floor sand, thus providing for their natural expansion and contraction. After this, came the crucial question of what contour to give the lining, having regard to the gravitation of the metal down to the center of the well. We determined to adopt the blast furnace bosh—the scientific angle of which I knew to be from 68 to 80 degrees. I had another reason for this decision. In February, 1894, Mr. W. J. Keep—the authority in the United States on the physical characteristics and physical testing of cast iron—took me to the charging hole of an idle cupola in the Michigan Stove Co. and asked me to observe the form of the lining, how the diameter was reduced over the tuyeres, the cupola by a natural law forming itself into a bosh, and, said he, "if we follow the lines made by the cupola itself, we can not get far wrong." So I provided a bosh. Again. Hard earned experience had indelibly fixed in my memory the importance of keeping the tuyeres clear, hence I sloped back the bosh base to the pointed top of the tuyeres; in this way, protecting them from the dropping metal, and directed the blast upwards to the center of the cupola. Further, over the old slag hole, a plate had been riveted. When I spoke to the cupola tender about fluxing, he simply gazed into space. But inasmuch as under the new regime it was contemplated doing heavy machinery molding (and in a very few weeks we poured a casting weighing 15 tons), I saw to it that provision was made for taking out "slag" or "cinder." Having been reared in a school of foundrymen, who believed that, as in the blast furnace, so in the foundry cupola, "everything pitched into its throat, must come out either as a gas, or, as a liquid." That "the rentention, or formation of any infusible solid would 'choke' or 'gob' the furnace, or cupola, and put an end to its profitable operation." There is a common fallacy evident among cupola workers, that the object in using limestone is, by explosions caused by the cracking of the stone under heat, to create a better circulation of the hot gases, among the charge, with consequent acceleration of the melting, and

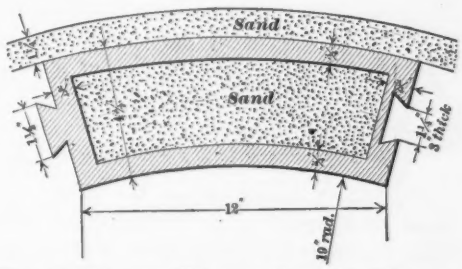


FIG. 3—PLAN OF HOLLOW CAST IRON BRICK.

increased fluidity of the metal; and as a corollary, that the metal can be melted at a lower temperature. The actual reason, I understood to be this. The pigs of metal when delivered from the blast furance, are covered with coarse, gritty sand, consisting of free silica, and when this sand is subjected to intense heat it is resolved into a soluble glass, which soon clogs up the cupola, if allowed to accumulate in any quantity. It is therefore necessary to introduce some cheap agent, which is readily soluble, is of lighter specific gravity than iron, hence will float on the top; will not readily combine with the iron; but, on the other hand, has a strong affinity for silica and kindred impurities.

Limestone has been found to combine all these necessary qualities, and, being cheap, has been used as a flux almost universally

The greatest event in the history of the foundry business since the first casting was made will be the Philadelphia meeting May 12, 13 and 14.

for generations. The stone consists of the acide of calcium, in combination with carbonic acid, and is mainly in the form of carbonate of lime. Upon being subjected to heat, the carbonic acid in the stone flies off, leaving caustic (burning) lime behind. This lime, reaching the top of the metal in the crucible, combines with the silica from the sand, etc., floating thereon, with which it combines, to form a liquid lime—glass—and runs out through the slag hole provided for its exit—just below the tuyeres. In digressing thus, I must not be understood to advocate the use of limestone as a flux, for, in one respect it is a wasteful agent; it requires a considerable expenditure of heat energy to separate the carbonic acid from the oxide of calcium, energy which might be utilized for the heating of the metal and coke. Indeed, I confidently predict the coming day when the necessity of fluxing in the cupola will almost cease to exist; for the pigs of metal—covered with sand and other impurities—will be thoroughly cleansed by the sand blast process, before being thrown into the cupola.

Considered merely from its social side alone the meeting in Philadelphia will make every foundryman who is there feel more kindly towards his fellows and cause him to have more respect for his competitors.

Money Saving Devices in the Foundry.

E. H. PUTNAM.

Costs that might easily be avoided, consume much of what might go to swell the profit fund in many foundries. There are certain well-understood processes current in foundry management which the foreman may undeviatingly employ without liability to just censure from his employer.

Yet, a departure from prescribed rule is frequently very profitable.

Edison is said to have averred that his great success was due to the fact that he knew of so many things that would not work. So, in respect of novel devices in the foundry, it is quite as important to know where their use would be unprofitable as to know where to employ them with advantage. Novelty, for its own sake, has no place in business; at least, in the business of iron founding.

While it might be impossible to name any particular feature in foundry practice that is not known to someone else, yet there are scores who do not know it, and who may be profited by the exposition.

What per cent of the foundries of the country requiring a casting like the one shown in section at Fig. 1 and in plan at Fig. 2 would think of making it without first providing a wood pattern therefor?

A very simply constructed sweep is all the pattern needed to form a circular mold like this.

Make two strickles, or sweeps, as shown at Fig. 3 and Fig. 4. Also, turn a gudgeon (B) or shaft of wood, having one end perfectly level and, of course, at exactly right angle to

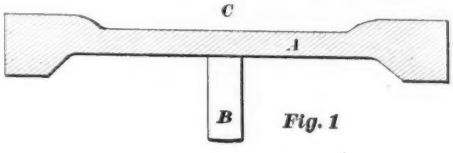


Fig. 1

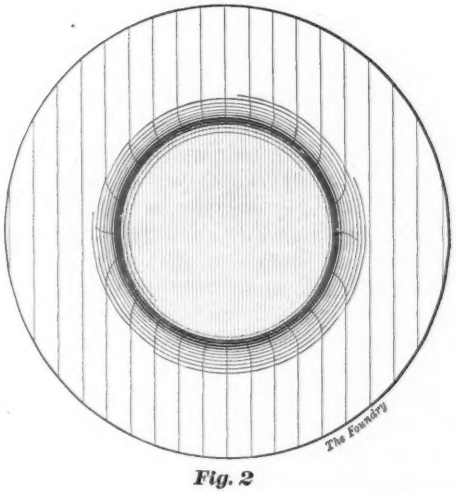


Fig. 2

the side. Bore a hole in the center of this end, whereby to affix the sweep by means of a large wood screw. Now, set this end of the gudgeon down on a smooth level followboard, and weight it down heavily so that it shall not be disturbed while the nowel is being rammed. Ram the nowel just as you would if a complete pattern were on the followboard, and vent thoroughly. After rolling the nowel and removing the followboard, rough up the sand of the joint with the fin-

gers or otherwise. Now, screw sweep, Fig. No. 3, to gudgeon; then build sand upon the mold, compacting it by striking with the hand. When a short section of the circuit has been so prepared, place one hand on the sweep just over the center pin, and, holding it down firmly, with the other hand work the sweep forward and back. Depressions will appear, which must be filled with sand, packed, and swept over again and again, till the whole circle of the mold surface shall present the shape of the upper side of the casting required. Do not fear to make this surface hard, and to sweep till it shall be approximately smooth. Now throw on a liberal supply of parting sand, and carefully rub it in all over the surface with the hand.

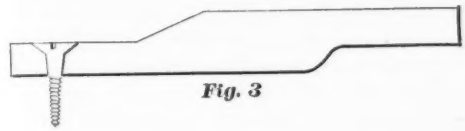


Fig. 3

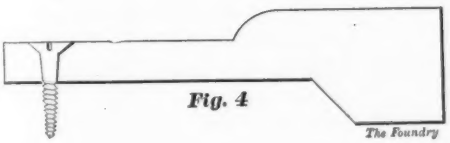


Fig. 4

The Foundry

Brush it off with a soft brush or, if necessary, use the bellows, and then apply parting sand in the usual manner for separating the mold joint.

Ram the cope very carefully, being careful not to let the peen of the rammer indent the joint. Use the butt of the rammer with as much force as usual, but take extra care to ram evenly. Having raised the cope, use a short, straight-edged strike to correct any unevenness of its surface, finishing with the trowel. Affix sweep, Fig. 4, to the center pin, rather loosely, and sweep round, cutting off a little sand at a time till the proper depth is nearly reached; then screw the sweep down firmly, and, holding it down on the gudgeon with one hand, as before, with the other work the sweep till the bottom side of the mold is satisfactorily finished.

Now remove the sweep, and if no gudgeon is wanted in the center of the casting, remove it, and fill the hole with sand. The upper edge of the outer walls of the mold will be somewhat ragged, but a little work with the trowel will correct this. In sweeping a mold in this way, there is always a probability that the walls will be disturbed in places; therefore, after closing the cope, lift it again and thoroughly examine the walls, feeling them with the fingers, and when certain that all is right, finally close the mold and clamp it.

If the foregoing operations have been skillfully performed you will get just what you want from this mold.

I recently made, in this way, two castings, each 26 inches diameter by 2 inches thick, having in the center a gudgeon 12 inches long by 5 inches diameter. The cost of pattern-making and molding combined was less than $1.50. These castings were finished in the lathe for patterns. If absolute accuracy had been required, a regular sweep-spindle and socket would, of course, have been employed. But the device described is efficient in most cases.

The Philadelphia Foundrymen's Association will tender to visiting Foundrymen, a banquet in the Academy of Fine Arts that will live long in the memory of everyone who attends.

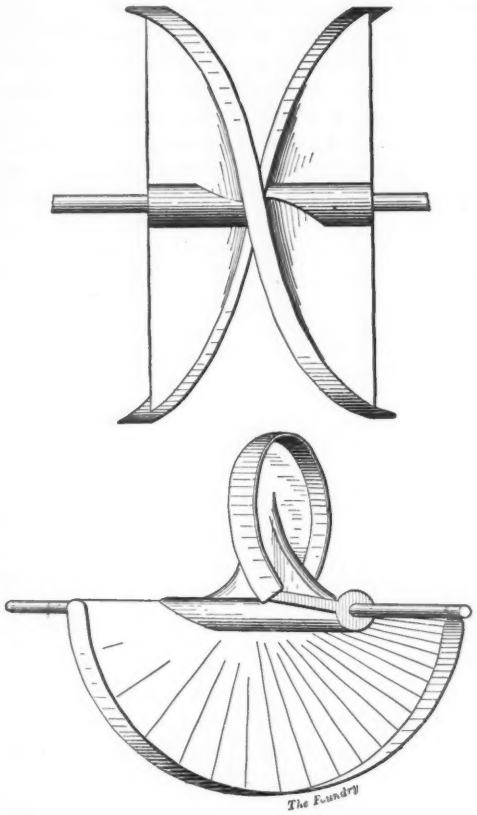
The Hall-Sloan Propellor.

F. W. PAINE.

A peculiar propeller, destined to increase the power on steam vessels using propellers, has recently been cast of bronze in San Francisco, by Whyte & De Rome, proprietors of the Globe Brass and Bell Foundry. It is a recent invention of two machinists, Messrs. Hall and Sloan, who have conceived the idea or having a flange made on the rim of a two-blade wheel, believing that an increase of power could be obtained with the addition of the flange; previously, a smaller wheel had been cast and experimented with, on a small tug in San Diego harbor, and proved a perfect success, so much so, that when the attention of Mr. J. D. Spreckles was called to it, he, upon examination, gave orders to build the one just cast for his powerful tug "Reliance," working in the bay of San Francisco.

The molding and casting of this propeller was as much peculiar as the propeller itself, for it was molded without a pattern; a sweep only being used and that of but one blade; the mold was made in loam ,and after the two lower halves were built up, turned over, dried and placed in the pit back to back, strips of wood the proper thickness the casting was intended to be, were tacked every five or six

inches the entire length of each blade, and the intervening space filled in with molder's sand, and a parting placed over it. The copes were then built on top of the lower half, using the usual methods employed to stay and lift heavy bodies of brick and loam. After lifting off the copes, and strips removed, the lower



halves finished and dried in position, the copes were dried and finished in a hanging position on the oven carriage.

The size of this wheel is 6 feet six inches in length, 6 feet six inches in diameter, with 5-inch flange and 13-foot pitch, the depth of the flange being one-half that of the pitch. Its weight is 2,700 pounds and is cast of gun metal, U. S. standard.

Pokey's Pointers.

Pokey has been wearing his funeral face for some time, and all of his transactions have been heavily saturated with acetic acid because he lost a few hundred dollars by extending his credit beyond the legitimate limit. As Tom Bowers says he furnished himself with a pointer and paid for it in advance. Pokey, like other men, and especially like other foundrymen begins to find fault with everything in sight as soon as a severe headache strikes him. When he is on his ear he can see things that it would be impossible for him to find with a microscope when in good humor. The other day he ran across Tom Bowers out in the alley holding a post mortem examination on the remains of a defunct casting and started the ball rolling by injecting a few ounces of his own soured-on-the-world disposition into Tom's hide by saying:

"It is devilish poor men you keep about you, Tom. I want you to fire the whole gang; clean the shop out and see if we can't do better. You will have to get a move on them anyhow; stir them up. You have absolutely got to push men nowadays in the foundry business to get your money back."

"I understand," said Tom, as he muttered something about being hanged if he could see where the dirt came from in a certain corner. After agitating his thinker for a few moments he turned towards Pokey with the remark: "It is about time that you started to jack everybody up to the tune of the Star-Spangled Banner."

"What do you mean?"

"You have been getting another contract, haven't you?"

"How do you know? Do you get inside information from my office force?"

"I don't bother my head about your office. You are giving yourself away. Now you've got a contract, haven't you?"

"Yes, and I wish I had never heard of the confounded job."

"Just so. You got it because you hated to see somebody else get it. You put in your bid, secured the work, and then sat down to figure out what it would cost you to do it afterwards."

"That is my case exactly, Tom; but how do you happen to be so well informed?"

"We will get around to that after awhile. You have been getting business after the Michigan fashion. That is a peculiar trait of foundrymen up there, and if you have become innoculated with the germs of this mania, you had better get a good disinfectant to straighten you out. It is always best to do your thinking before bidding, but some men try to do business by doing their bidding first, and

their figuring afterwards. When they find that their estimate is about ten per cent. below cost they come around, like you have done this morning, and talk about getting men to do more."

"Well, we have simply got to get it out. I am under bond to do so. Keep the blast back a bit, Tom, and make them toe the mark. They ought to have interest enough in the business to help us out. What do you think?"

"I have had hard work to get you out of deep water more than once," began Tom, "but no sooner are you on terra firma before you start to swearing because you are out. What do you think makes men work?"

"They can't help it; they have got to," promptly responded Pokey.

"They have eh? Never try to run a shop with men who work because they have to. Men work for three reasons: Love of work, necessity and inducements. Now, the first kind we are not bothered with—nobody but students do that until their theories are exploded and then they say good-bye to love for work and hail with delight the rumbling sound of the dollar. People who work simply because they must are a great deal like those in a chain gang; so many hard licks make a dollar, and if there is a chance to shirk you can bet they will be found there. These are the ones that sit down in the sand shed and take a smoke, while you are busy hollering for them. How would you like to come out here and expand your chest hitting the earth? You would have a great deal more respect for this calling afterwards. The appetite you would develop would tower high above your love for the work. And when you went home at night and your children began talking about black men, and you felt as if you could eat a horse, you would think twice before taking contracts by mind-reading.

"I will have to go, Tom. My head hurts. Come in this evening before you go home, and let us see if there is not something we can straighten out."

"Yes," said Tom, after he had gone. "Now it is 'us' and 'we,' but when it comes to blowing the shop up, then 'I' and 'me' seem to have the controlling interest.. Here the old man has gone and made a high-galooting donkey of himself, so that he can swell up like a life preserver, when passing the Eureka or the Tubal Cain, and what satisfaction can it be to him to have to heehaw and scratch, and then may be have to pay for the plumbago used on the job out of his own pocket. Here he has been blowing around that he would show the other shops the tail of his kite if it did cost him a few dollars, and the minute it looks like it was going to here he comes coughing up his little tale of woe, and wants to get into the bandwagon; and nary a word does he say about how much he would like to have a losing job on his hands just for the fun of it. A man don't have to look far for that kind of fun, like one hunting for trouble he can always be accommodated. I guess his head does hurt. He makes me think of a man trying to lift himself by his bootstraps."

If you are going East this season try to so time your trip as to be in Philadelphia May 12, 13 and 14.

Trolley Systems.

BY H. M. RAMP.

Overhead trolley systems, operated with compressed air, electricity, or by hand, are one of the modern improvements in the foundry, and have opened a wide field for the facilitating of rapid and easy production; they can truly be classed "labor-saving machinery." Numberless devices have been constructed along this line, and operated in almost every conceivable manner. They are a result of evolution, we might say, from the traveling-crane, and in the various shops of the country it can be witnessed in its various stages of development. Some of them show skill and judgment in their erection, others the poorest kind of ability. The demand for a crane in foundries that will cover more territory, led to the partial substitution of the traveling crane over the old-style jib crane, but it worked too slow for light crane work, and could not be in two places at once, so this demand led to the further development and adaptation of the trolley system in foundries, and as far as the writer knows, there is nothing that equals it for light crane work.

The advantage of an overhead trolley system, if properly constructed, is not to be disputed. It will cover more territory at a lower cost, work more rapidly and easily than any crane ever built, unless it is to be used for heavy work, and even then if used

in conjunction with electricity their service would be matchless.

But for work where the lifting power required is from five hundred to two thousand pounds, and this embraces three-quarters of the crane work made, there is nothing superior. It has often appeared ridiculous, and a waste of time and energy to see a ten or twenty ton trucking crane, or a big heavy jib crane swinging around, and all the rigging changed or adjusted to lift a flask weighing five or six hundred pounds, assume, but what there are shops, and times in all shops, where it is necessary to do light work with heavy, cumbersome rigging, or even the reverse, do heavy work with light rigging, which is still more unsatisfactory, but there are many concerns who simply build a crane large and strong enough to do their heaviest work, and make no provision for the intermediate class, which is nearly always in the majority, and upon which the most money is made and the greatest production expected. Too often there is nothing between the side-floor and a ponderous slow-working ten ton jib crane. This is a mistake many foundry men recognize to-day, and the trolley track system is one of the means taken to provide for the deficiency. It is very pleasant to the ear and elaborate to the eye, to go into a large foundry, and be told they own two or three, as the case may be, twenty or thirty-ton electric cranes, that run all over the shops, and do all the work. It sounds nice and looks big, but when you step into the foundry and find fifty or seventy-five molders working under these two or three cranes, and on a grade of work that sometimes makes them monopolize the cranes for hours, setting cores difficult to place, or similar work, and here and there through the shop molders sitting on their flasks, waiting for the crane, or putting in time cleaning their shovels, or polishing the parting of the molds with their trowels while they wait, you will form an opinion that something is not managed just properly, and the cranes do not look so promising or rapid. The writer could point out a number of shops that are doing that very thing daily. Too many traveling cranes in one shop do not do well, or solve the problem of waiting on each other, for they get in each other's way, and an attempt to transfer anything from one end of the shop to the other means changing the load from one crane to the other and constant delay and expense. Jib cranes suffer the same fault, only in a greater measure, and have more failings. A jib crane, swinging in a circle, makes a floor that is round. You can crowd more molders around it than one would think possible, but it is always done at a loss. Then there is always a large area of lost room in the center where the crane stands, and the corners it cannot reach. If there are a number of jib cranes in a shop, it is also a slow and unsatisfactory way to handle iron from one to the other, unless it is run out on trucks.

I do not desire to convey the impression that cranes are a mistake, and should be rubbed out of foundry practice for there is nothing nicer or better in a foundry doing heavy work than a good traveling crane, but too much, as a general rule, is expected of them, and other facilities should be made to do the lighter work.

The trolley system obviates this difficulty. It can be built to run direct from the cupola to every floor, if necessary, and never be in each other's road; the castings can be removed from the floors to the cleaning room by its use; also, a line to the core-room is very useful, for all large cores could be handled direct to the molds from the core-ovens, and consequent breakage and rough handling be reduced to the minimum. Every molder knows the trouble he has experienced in loading cores on trucks or carrying them by hand to the mold, and how often he bruises the edges or breaks off some delicate corners.

Flasks can be run to a certain point and loaded on cars and removed from the shop, or even a line can be arranged to run out of doors to handle the heaviest flasks. Do we ever stop to consider what it costs to bring a flask in the shop that weighs two or three tons, when we have no facilities but a track and car, to handle them with? It has been the writer's experience to find it often cost him six or seven dollars to get a half dozen large flasks in or out the shop in one

Judging from the reports thus far received, the entire city of Philadelphia will be at the disposal of those attending the Foundrymens' Convention. Mayor Warwick will welcome the delegates and make them promise not to carry off the city hall.

day. With a little study and observation a foreman can tell about how his work will run, what room he needs for certain floors and where the tracks should be placed, then a track should be made for every floor upon which work is expected to be made that will require lifting power, and a trolley supplied to each individual molder. This may sound extravagant, but it means simply, a crane for each floor, which means, the molder will have no one to delay him, no one to wait upon, no change of rigging, unless it be for himself, and also that he will require no helper if the system is operated by compressed air or electricity, and even by hand, with a chain-block, he can do his own hoisting. Special rigging, beams, slings, etc., can be made that will reduce the time of applying same to a wonderful extent on special jobs. Watch a half dozen molders working under one jib crane, see one lower down his cope on horses or blocks, five minutes before he is ready to close, simply to let some other molder have the crane, and then have to wait himself, and possibly change all the rigging again. Is that economy? The trouble is, as stated before, because a jib crane covers a large territory, too many molders are crowded under them. There is no economy in working over two or three molders under one crane on ordinary work, except on a short rush. Although the writer has seen as high as ten molders working under one crane continuously, and they also waited continually. There are most certainly places where the jib crane is to be preferred to the trolley system, but the cases are few, and they must not be crowded to obtain the best results.

A shop can be kept more orderly than with cranes, the rigging is all over-head, and out of the way, and every inch of room the track covers is available, floors will be straight and in line for the trolley that lifts them, sets them in position for pouring from the same track they were lifted on, or an auxiliary track run between every two floors for that purpose.

FIGURE 1.

The over-head fastenings, or the timbers that support the track, are of the first importance in constructing such a system. The roof must be strong enough to carry the additional weight of track and loads used thereon, or more columns and supports put in, so there will be no settling and consequent throwing out of level the entire track. One

The Foundryman who can arrange it and fails to be in Philadelphia, May 12th, 13th and 14th, will miss one of the important events of his life.

shop in Iowa adopted the plan of building a separate structure inside the shop, and independent of the main roof to carry their track, and it proved an admirable plan for the roof was not strong. The writer has also witnessed trolley tracks erected in a manner that should cause a shudder for the safety of those who had to work under them.

Nothing could be more dangerous than a weak, illy-constructed trolley track, or anything more safe and secure if properly constructed, for the load is applied in direct lines. He has also seen one built and carried by timbers 3x12 and from twelve to sixteen feet between supports, and while

FIGURE 2.

this may be safe, it does not run so well as when the timbers are stronger, because when the load approaches the center of the timber it springs and permits the track to sag and make a low place, requiring additional power to push the trolley up hill to the next girder or support. These timbers should be heavy enough to carry the largest loads expected upon them without the slightest spring, then the track will remain level and safety not be a question.

The style of track and trolley is one that has attracted a great deal of attention and experiment. The single rail has been tried often, and for some purposes answered excellently, but never to my knowledge with perfect success in the foundry, besides it is questionable if a safe and serviceable switch can be made with the single rail. The double rail track, on the other hand, has given splendid satisfaction, and especially when the proper style of trolley is used which will be referred to later on. On straight lines of track, the problem is more simple, but the design of track and trolley to carry a load of a ton over curves and switches easily, is quite a study and experiment.

The Atlas Engine Works of Indianapolis, and Murray Iron Works of Burlington, Ia., use the system shown in cut No. 1 over their molding machines, the photo being taken at the last named place, and it does good service. The hangers are cast iron, and the rail wrought iron. This undoubtedly makes the best track it has been the writer's privilege to see.

The cast iron hangers are strongly built and are supported with inch or inch and a quarter bolts, according to the load they are expected to carry, and give better service than any wrought hanger on account of their rigidity. The rails are 4x¾, and the track shown will carry a load of two tons with ease, but the size of trolley shown does not work easily with over a

"The Foundry" will be at home on the second floor of the Manufacturers' Club, where it will be pleased to have its friends call.

ton load, that is, so that one man can handle it on the curves and switches without trouble or assistance, and in fact this track is never used for anything heavier. The wrought iron rail is undoubtedly the safest, but even here some judgment must be used in its dimensions, as an incident upon this point is recalled to mind. A certain establishment undertook to erect a short line of this track for light work, not to lift over one thousand pounds, and concluded to save the expense of so heavy a rail, and use 4x½ iron instead of 4x¾, which was done. But the saving was not a success, for even with a light load, the rails would spread, and let the trolley drop through, and instead of using hangers six feet apart, as is the usual practice with this style of track, they had to double the number, and put them every three feet before the thing could be operated with safety and success. There does not appear to be any set formula for sizes in such a case, but the rails have to be heavy enough to resist all tendency to spread, or the distance made less between hangers, and in this there is no economy. Another advantage of this kind of rail is that they are all the same size, besides being straight and smooth upon the edges. Fig. 1 also shows the style of switch point used with wrought rails and the braces running from the hangers to the timbers above to prevent any possible swing or play in the track sideways. This track was erected over a large pneumatic molding machine, using iron flasks, 24x36 square, and has been in constant use for two or three years, the flasks both empty and full are handled with it, the iron is all poured with the air hoists, and even the shaking out is entirely accomplished by this means. Fig. 2 shows the general construction of a track erected by the Crescent Iron Works, Springfield, Mo., to do light crane work, and to handle the iron for heavy floors, which gives good service and proves steady and safe.

NOTE. The balance of this article will appear in our May issue. As there are ten engravings altogether, eight of which go with Part II, it is one of unusual interest to foundrymen.

"The Foundry" has already learned of different parties from various sections of the country who have decided to be in Philadelphia when time is called.

New Foundry Enterprises.

The Empire Foundry are erecting a new building at Marysville, Cal.

The Stout-Park Foundry & Machine Co. is a new concern at Carthage, Me.

C. M. & J. B. Hart are building a new Foundry at Clarksburg, W. Va.

The Wilmington Malleable Iron Co. at Wilmington, Conn., will enlarge their Foundry capacity with a building 50x90 feet.

There is a prospect that the Pan Handle R. R. may erect a large foundry at Logansport, Ind.

The Donaldsonville Foundry & Machine Co. at Donaldsonville, La., is getting into shape for business and will be enlarged.

G. H. Holliday, of Ironton, O., is erecting and will operate a stove Foundry at Middlesborough, Ky.

The Bath Iron Works have begun the erection of a new Foundry, 150x130 feet, at Bangor, Me.

The Chattanooga Foundry & Pipe Works at Chattanooga, Tenn., has purchased the idle property of the South Fredegar Iron Works, in that city.

A New Alloy for Iron Mixtures.

C. T. Holbrook, of Philadelphia, Pa., well known in the iron business as an experienced furnace man and as well as having given the subject of "Pig Iron and Its Alloys" considerable attention, is arranging with one or two Foundries in each locality to use his method of refining iron in the ladle. Mr. Holbrook makes some very strong claims concerning his process, and states that it has been in successful operation for five years past. The value of the method consists in enabling the foundrymen to make a high grade casting at a reduced cost. In other words, a cheaper grade of iron can be used and castings will be tougher and stronger, and especially suited to castings that require to withstand a heavy pressure.

Mr. Holbrook asks no one to take his word for this but simply offers to send by mail full information to responsible foundrymen who may secure the right in different sections of the country. If after a fair trial it is fully satisfactory arrangements can be made for its permanent use.

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THE FOUNDRY

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The Williamsburg News Company, Brooklyn, E. D., N. Y.
The Wisconsin News Company, Milwaukee, Wis.

Trade Outlook.

Will history repeat itself in '96? is the question. In April, 1895, occurred a sudden improvement in the iron and Foundry business that was nothing short of a boom.

This lasted during nearly the balance of the entire year, and the falling off that preceded the holidays has as yet never been regained.

While the volume of business being done has been at no time abnormally small, yet it has for several months lacked any special degree of vigor.

It is doubtful whether we again will see any extended continuation of what people are wont to call "good times." Business will hereafter be done on smaller margins and with closer relations between manufacturer and consumer.

The ease with which manufacturing facilities can be extended and the competition existing between a constantly increased number of producers, must always serve as a wholesome check upon any undesirable inflation.

Yet there are going to be thousands of tons of iron melted and thousands of men busy at work making castings, and millions of dollars will continue to be invested, yes, and made out of the Foundry business. But the secret of it all is going to be that to "him that hustleth will be given," and this will be more true during the coming years than it has ever been before.

Pig iron during the month past, has risen somewhat in price, and so it should. Ore, coke, railroad rates and wages have all risen, and when the large producers are compelled to raise prices how can the little fellows expect to pull through. Coke and other materials exhibit no signs of weakening and are likely to remain where they are for some little time to come.

Among the Foundries business remains about the same as last month, with a slight improvement among shops interested in railroad work, and a further decline among machinery Foundries. Politics do not seem to be the bug-bear they have been in previous presidential years, as the result as far as the national parties are concerned, seems assured.

On to Philadelphia, May 12th, 13th and 14th. Don't miss it.

The Scrap Heap.

And so there is going to be a convention of Foundrymen? A monster gathering in the city of Philadelphia of those most interested in the Founder's art.

Well, we predict it will do much good and that the results of this meeting, direct and indirect, as they will appear to future writers on Foundry topics will be of such importance as to almost start a new epoch and commence a new era in the history of the Foundry business of the country.

* * *

Let pessimists and heretics make the kind of predictions for which their kind have been always noted, but their indifference and opposition will only serve as a stimulant to invite those who will lead in this as it does those who lead in all movements, to exert themselves to the utmost.

* * *

They have their place, therefore, in the great body politic, and though the world is never their debtor to any great extent and mankind is not much better off because of their existence, yet by the same token and by a pleasant clause in the law of compensation, they are repaid in kind and hence are the principal losers.

* * *

It is the live, aggressive, ambitious, unselfish optimist who ever sees the silver lining to the cloud and who encourages undertakings like this one, and is found at the front helping to make them a success. It is to him that the world owes debts it can never repay and which are not contracted with a view of receiving compensation.

* * *

Yes, the Philadelphia meeting will be a brilliant event. There is plenty to do; there will be no lack of volunteers to push and manage the good work, and what more is needed?

* * *

Let doubters look for a moment at what has been already done and is being done by the local associations.

* * *

Take just as an instance the proceedings of the Western Foundrymen's Association, appearing elsewhere in these columns.

Could anything be of greater practical value to the Foundry trade of these United States than the apprenticeship system, involving, as it does, our future supply of competent mechanics?

* * *

Here we have the question discussed in all its bearings, by a number of practical and experienced men, who, while perhaps differing in matters of detail, agree in the main and suggest various remedies.

* * *

But they do not stop there. A committee is appointed to prepare a report embodying therein a policy to be adopted and followed, and a form of indenture to be observed.

* * *

This is only one sample taken from hundreds of others, but one is enough. These associations in their way have been and are doing wonders and the result will be a benefit to the Foundry business now and in the future, and how much more sure is a national association to succeed equally as well on the broader lines and with the weightier questions that will naturally come before it.

* * *

If there are any doubters let them stand up and be counted.

A fare and a third for the round trip on all railroads has been granted by the various Traffic Associations for delegates attending the convention. In buying your ticket be sure to explain that you want the reduced rate and secure a certificate.

Krank's Korner.

Fraternal greetings between the employer and employe are with what we are pleased to term advancing civilization, fast disappearing. With the expansion of industrial enterprises the familiarity our fathers used to enjoy with those for whom they toiled is going out of date like the horse car.

* * *

We believe there are some things which if they do be old are still worth retaining and amongst these we claim for a closer acquaintance between masters and men, the right to have it accorded an extension of time. It contains curative abilities enough to heal most of the sores now existing. We are church

members enough to believe that as descendants from Mr. and Mrs. Adam all men who act and live like men should never hesitate to cultivate the society of each other, and especially between the employer and the employe the scriptural command to love one another should not fall on deaf ears, or at least should not be acted upon in an exactly opposite direction.

* * *

It may be conducive to the coining of dollars to treat employes as if they were so much personal property, but we are far out of the way if there is not other things in this world worth having besides money. An employer may believe himself to be acting for the best by turning his entire power of authority over to his subordinates and yet why should he refuse to act as a last court of appeals. Superintendents and foremen may be ever so capable and still commit an act of injustice. Without a chance for an impartial judgment to be passed, a growing of discontent and contempt for a concern takes the place of the quiet reasoning promoted by the certainty of every man being given an opportunity to unload his grievance in the confidence that a thorough inquiry will be made into the merits of his claim.

* * *

Capital and labor we know are creating an abyss between them. May we not trace the cause of this as much as anything else to the disappearance of habitual mingling of employers among their men, leaving whatever relations do exist between them to be entirely conducted by middlemen, who we may be sure will never report anything throwing discredit upon their own actions. The real cause for many a strike is pigeonholed in the hollow chest or sometimes hollow head of men who were appointed to pilot the industry over commercial seas, and instead of tending to business went below and got intoxicated with the importance of their own greatness, resulting in wreck and mutiny.

* * *

We know of a firm who, while they leave their superintendents have full sway, still feel that they are committing no breach of etiquette by saying a gentle word to their men when in their vicinity. They are not the least bit ashamed of inquiring about an employe's family or his circumstances. Life in such a shop seems almost as pleasant as home itself, and we find this firm doing business without that modern appurtenance known as changing hands.

* * *

Every summer they have the pleasant habit of hiring a train and providing a day's outing for their employes and families in some beautiful spot, and my friends, they don't do this on Sunday either. They take a whole week day to close up shop, and mind you, they pay their men the regular day's wages besides. They give no man an excuse for not going along and forgetting his troubles. They don't do philanthropical work of the kind some of our foundrymen are getting stoop-shouldered at by letting their men off at 5 o'clock on Saturday and then make this up by giving them fifty minutes for dinner throughout the week. They have that rare insight to know that it is a better policy to actually give a workingman something than to hypnotize him into believing that he is getting an apple, when he is only getting a potato, for when he is removed from such influences and wakes up he soon finds out that he has been fooled and like an elephant he will only be waiting for a chance to show his resentment.

* * *

When men leave their code of society observances at home and trust themselves to their own common sense they may in the estimation of some "400" lower themselves by mingling so promiscuously with those in a lower station of life, but when all virtues of humanity are checked up, when it comes to paying us off with our just dues such men will surely not get an empty envelope.

* * *

Such men can sleep without dreaming of somebody scheming to break their shop windows or conspiring other kinds of deviltry to get even.

* * *

No one is heard wishing these men to a health resort where the sojourners are compelled to take a sulphur bath before breakfast. They may not leave quite as much money as their buzzing competitors, who can't be happy unless on stormy waters, but when they drop off for a better land what a fine, well attended, genuine funeral they will have.

AT LAST!

American Foundrymen to have a National Association.

MEETING CALLED AT PHILADELPHIA, MAY 12-13-14.

A Large Attendance From All Parts of the Country Assured.

MUCH GOOD CERTAIN TO RESULT.

Reduced Rates on All Railroads.

MEETINGS TO BE HELD AT THE POPULAR MANUFACTURERS' CLUB AND WORLD RENOWNED FRANKLIN INSTITUTE.

Banquet tendered to the Visiting Delegates on Evening of Second Day.

It had been our intention in this article to review the work done since the first Foundrymen's Association was organized in Philadelphia, in July, 1891, but space forbids. It is a matter of history to which we can properly give our attention in a subsequent issue, and there is too urgent a call for information concerning the future. It was followed by the organization, in May, 1892, of the Western Foundrymen's Association, and from the birth of both of them they have been constantly extending their influence and making it felt.

But this is not all. They have succeeded in bringing foundrymen together, making them better acquainted, causing some of the rough spots engendered by keen competition to disappear, and made them feel the need of a national organization, that would permit of the extension of the good work beyond its narrow limits. Then again, a national organization can discuss and consider subjects, and if need be solve problems and undertake reforms, impossible in the case of a local body, because of the latter's inability to enlist sympathy or secure support beyond a limited circle of membership.

The farther the local idea has been carried out the more apparent has become the need of a central body, that would push the formation of local associations in different portions of the continent and endeavor through them to accomplish those purposes that could not be successfully handled in any other way. The adoption of a standard system of physical tests for cast-iron work, the consideration and if possible the final acceptance of a plan whereby strikes, lockouts and other labor difficulties between foundrymen and their employes would be a thing of the past, and the enforcement of a uniform apprenticeship system, are only among a few of the subjects that could be successfully handled and settled by a national association, and by it alone.

With these and other ideas in view, the Foundrymen's Association of Philadelphia have made all the necessary arrangements, and issued a call for a meeting to be held in that city May 12, 13 and 14, for the purpose of making the necessary arrangements to carry out the plans explained in the following call, copies of which have been extensively mailed to prominent foundrymen everywhere:

The Formal Invitation.

Philadelphia, April 10th, 1896.

Dear Sir:—

You are invited to attend the first national convention of Foundrymen ever held in the United States, at Philadelphia, Tuesday, Wednesday and Thursday, May 12, 13 and 14, 1896. It is to be held under the auspices of the Foundrymen's Association of this city.

The object of this convention is to bring about a more friendly feeling among the foundrymen of this country and to present and discuss papers on interesting subjects and to encourage the formation of foundry associations in every part of the United

The Philadelphia Daily Newspapers have "caught on," and are devoting large portions of their space to the meeting. Evidently they are beginning to realize that something of importance is going to happen.

States where it is possible to do so, believing in the end good results must follow, the idea being to advance the foundry business in every way.

Question Box.

If you have any subject of general interest to the foundrymen that you would like ventilated, please send word to the secretary promptly, that it may be referred to some member who will lead discussions on it, one of the questions being "Convict Labor and Its Relation to the Foundry." Every foundryman engaged in iron, steel or brass, will be welcome, as well as his wife and lady friends.

Each visitor will be known as a delegate representing his firm or corporation.

Headquarters.

The Manufacturers' Club, 1409 Walnut street, will be the headquarters for the meeting, a purpose for which it is well adapted, having restaurant, cafe, ladies' ordinary, etc.

MANUFACTURERS' CLUB, WHERE EVERYONE SHOULD REGISTER UPON ARRIVAL.

Hotel Accommodations.

The new Hotel Walton, which compares very favorably with the Waldorf of New York or any of the best hotels of the world, situated on the corner of Broad and Locust streets, has been selected as hotel headquarters. Price, European plan, $1.50 per day and upwards; American plan, $3.50 per day and upwards.

The other hotels near by are the Bellevue, Stratford, Lafayette, Colonnade, Hanover, Windsor, Bingham and Vendig.

HOTEL WALTON, HEADQUARTERS.

Walton, Broad and Locust streets, European, $1.50 and up, American $3.50 and up.

Bellevue, Broad and Walnut streets, European $2 up, American $4 up.

Stratford, Broad and Walnut streets, European $2 and up, American $4 and up.

Lafayette, Broad and Sansom streets, European $1.50 and up, American $3.50 and up.

Colonnade, 15th and Chestnut streets, European $1.50 and up, American $3.50 and up.

Hanover, 12th and Arch streets, European $1 and up, American $3 and up.

Windsor, 1223 Filbert street, European $1 and up, American $2.50 and up.

Bingham, 11th and Market streets, European $1.50 and up, American $2.50 and up.

Vendig, 12th and Market streets, European $1 and up, American $2.50 and up.

As the most satisfactory quarters are always obtained by writing in advance to the hotels direct, it is particularly suggested that you write them, inclosing self-addressed envelope, as misunderstandings and disappointments may thereby be averted, asking for accommodations, mentioning the name of the National Foundrymen's Convention, as arrangements for satisfactory rates have already been made. Remember, first come, first served.

General Announcement.

The delegates will meet at two o'clock in the afternoon of the first day, May 12, when the mayor of Philadelphia, Mr. Chas. F. Warwick, will extend the freedom of the city to the delegates, followed by an address of welcome by our president, Mr. Francis Schumann, and the objects of the convention by Vice-President P. D. Wanner, of Reading, Pa., after which a regular order of business will be proceeded with.

Should the capacity of the assembly room of the Manufacturers' Club be too small, the evening session will be held in the lecture hall of the Franklin Institute, where every convenience will be found, in the way of magic lanterns, etc. The following papers will be presented at this and the sessions of the following days:

Papers and Authors.

1—"Chemistry of Iron, with Determinations and Their Value," by Charles James, M. E., of Hy. Disston & Sons, Philadelphia, and W. C. Henderson, chemist, of Thomas Devlin & Co., Philadelphia.

2—"The Strength of Cast Iron, with Samples," by W. J. Keep, Detroit, Mich.

3—"Apprenticeships, Their Value and How to Make New Molders," by D. J. Matlack, of I. P. Morris Co.

4—"Foundry Cranes, the Different Power Used to Drive Them," accompanied by lantern slides, by A. E. Outerbridge, Jr., of Wm. Sellers & Co., Inc. Philadelphia.

5—"Acid Open Hearth vs. Basic Open Hearth and the Wahand-Legensel Bessemer Process," by Jos. Hartshorne, M. E., of Pottstown, Pa.

6—"The Air Compressor for Use in the Foundry," by C. W. Shields, of Ingersoll, Sergeant Drill Co., Easton, Pa.

7—"Cupolas and Cupola Practice Up to Date," by Dr. Edw. Kirk, Philadelphia.

8—"Entertainment of the Delegates," by Mr. John Birkinbine, M. E., of Philadelphia.

9—"Utility and Advancement of Green, Dry and Loam Sand Moulding," by Thomas D. West, Sharpsville, Pa.

10—"Gear Molding and Gear Molding Machines," by S. Groves, of Taylor, Wilson & Co., Pittsburg, Pa.

11—"The Sand Blast for Cleaning Castings," by Fred C. Brooksbank, of Ward & Nash, Boston, Mass.

12—"Molding Machines and Their Appreciation," by Harris Tabor, of Tabor Mfg. Co., of Elizabeth, N. J.

The Banquet.

On the evening of the second day a reception and banquet, with music, will be tendered the delegates and lady visitors, at the Academy of Fine Arts. This hall contains the finest collection of pictures to be found in the city, and will be a most acceptable treat to the delegates. A fine band will be in attendance, and those disposed can pass a pleasant hour in the dance.

The third and last day, Thursday, will be devoted to visiting the different mechanical institutions and foundries in this section, we having received invitations from the following:

All are Invited.

Baldwin Locomotive Works, Philadelphia.

Wm. Cramp & Sons, Ship and Engine Building Works, Philadelphia.

Hy. Disston & Sons' Saw Works, saws, Philadelphia, Pa.

Tacony Iron & Metal Co., light and heavy castings, Philadelphia, Pa.

Wm. Sellers & Co., overhead cranes and tools, Philadelphia.

Southwark Foundry and Machine Co., Porter Allen Engines and Loam Work, Philadelphia.

Thomas Devlin & Co., machine and small castings, Philadelphia.

Camden Iron Works, Camden, N. J.

United States Mint, Philadelphia.

Pusey & Jones Co., marine engines and loam work, Wilmington, Del.

Harlan & Hollingsworth Co., cars, ships and general work, Wilmington, Del.

Abram Cox Stove Co., Philadelphia.

Bement, Miles & Co., tools, etc., Philadelphia.

A. Whitney & Sons, car wheels, Philadelphia.

As well as Thomas Iron Co., of Easton, Pa., to see how pig iron is made in Pennsylvania.

Those of the delegates who prefer may visit Wilmington, Del., Fairmount Park, or Atlantic City By-the-Sea.

During the days of the convention a bulletin board will be placed in the lobby of headquarters, at Manufacturers' Club, and at the Hotel Walton. All delegates are advised to take due notice thereof, and govern themselves accordingly, that they may be apprised of any change in, or addition to, the programme. Each delegate will be furnished with a badge of the Association, and he is expected to wear it in plain sight during the convention, thereby affording the officers and committees of the Association, as well as others requiring it, a means of recognition, greatly facilitating the work, as well as adding much to the enjoyment of social intercourse, rendering the work of recognition and making of acquaintance much easier.

DELEGATES' BADGE—BLUE AND YELLOW, PHILADELPHIA'S COLORS.

This Invitation is Signed by the Officers of the Philadelphia Foundrymen's Association, as follows:

Francis Schuman, Tacony Iron & Metal Co., Tacony, Pa.

P. D. Wanner, Reading Foundry Co., Ltd., Reading, Pa.

Josiah Thompson, J. Thompson & Co., Philadelphia, Pa.

Howard Evans, J. W. Paxson & Co., Philadelphia, Pa.

Walter Wood, R. D. Wood & Co., Philadelphia, Pa.

Thos. Glover, Glover Bros., Frankford, Pa.

E. E. Brown, E. E. Brown & Co., Philadelphia, Pa.

Stanley G. Flagg, Jr., Stanley G. Flagg & Co., Philadelphia, Pa.

Wm. F. Sauter, G. Rebmann & Co., Philadelphia, Pa.

Members of the Western Foundrymen's Association who have joined with the Foundrymen's Association at Philadelphia in sending out the call for the meeting:

Jno. M. Sweeney, Chicago Cons. Iron & Steel Co., Harvey, Ill.

A. W McArthur, Rockford Foundry Co., Rockford, Ill.

O. T. Stantial, Illinois Malleable Iron Co., Chicago, Ill.

S. T. Johnston, Whiting Foundry Equipment Co., Chicago, Ill.

Geo. M. Sargeant, The Sargeant Co., Chicago, Ill.

W. N. Moore, Joliet Stove Works, Joliet, Ill.

James Frake, Chicago, Ill.

A. Sorge, Jr., M. E., Chicago, Ill.

Thos. D. West, The Thos. D. West Foundry Co., Sharpsville, Pa.

E. D. Hanna, Gates Iron Works, Chicago, Ill.

Wm. Ferguson, Gates Iron Works, Chicago, Ill.

J. H. Dalton, Walburn, Swenson Co., Chicago, Ill.

B. M. Gardner, Iron Trade Review, Chicago, Ill.

John Pettigrew, Illinois Steel Co., Joliet, Ill.

Each delegate will be given a badge with a number, immediately upon entering and registering in a book, specially prepared for the purpose.

At the close of each day a bulletin will be passed around containing each delegate's name, [number, residence and name of firm or corporation with which he is affiliated. This will greatly facilitate the making of acquaintances.

Something about the Shops We are Asked to Visit.

Among the large Foundries who have invited the delegates to visit them are the Baldwin Locomotive Works, that has a capacity of nearly four hundred locomotives a year, and a reputation as wide-spread as any Foundry on earth. Mr. David Hansell, who is in charge, will be glad to show the delegates any courtesy possible.

* * *

Only a block away is the very large establishment of Wm. Sellers & Co., a Foundry that above all others should be visited. Mr. John Brandt is in charge here and will be pleased to show the many original devices this firm have added to their Foundry equipment. The travelling cranes here are a special feature. There are two very large ones especially in the iron Foundry, each with two separate carriages and hooks entirely independent of each other, so that one can be hoisted while the other is being lowered if necessary, or only one used as required.

It is said that the first power driven travelling cranes of large capacity were installed in this shop.

* * *

The Southwark Foundry is one of Philadelphia's most famous shops and probably makes a greater quantity of general machinery work than any other shop in that famous city. Their specialty is the Porter-Allen Corlis engine. Mr. Geo. W. Ellicott is in charge here, with Mr. Geo. Hetherington as his assistant.

* * *

A. Whitney & Sons' large car wheel works across the street from Wm. Sellers & Co. has long been famous for its car wheels and the fact that for many years they have devoted much time and energy to carefully studying the car wheel and how to make it withstand the heavy wear to which they are subjected. Mr. Adam Fredericks is in charge here.

* * *

Thos. Devlin & Co. operate one of the largest, small, grey iron and malleable Foundries in the eastern states, which have been built up in the lifetime and through the energy of Mr. Thos. Devlin, who still directs the business. Mr. W. J. Stapleton is in immediate charge of the Foundry.

* * *

Wm. Cramp & Sons' large shipbuilding works, covering many acres of ground, on the banks of the North Delaware, and where so many government vessels have been built, is sure to be an object of especial interest. D. J. Matlack, the veteran Foundryman, is here in charge.

* * *

Out at the Tacony Iron & Metal Co., a few miles from Philadelphia, will be found the works presided over by Francis Schumann, president of The Foundrymans' Association. While a large amount of good work is done here, much of it for the government, it is principally noted as being the Foundry in which was cast the mammoth bronze statue of Wm. Penn, which adorns Philadelphia's city hall.

* * *

The Abram Cox Stove Co. is one of the large stove Foundries of the country, presided over by Mr. A. C. Mott, who is also treasurer of the Stove Founders' National Defence Association. Mr. Mott ought to be of much assistance at a gathering like this as he is a great believer in the value of organization, and is full of original ideas as to how they should be managed.

Impressions Upon Cast Iron Surfaces from Lace, Embroideries, Fern Leaves, Etc.

BY W. J. KEEP.

I received a description of this process a few days ago from a friend, together with samples of embossing made by cast iron dies which had been made by Mr. A. E. Outerbridge, Jr., of Philadelphia. The work was so beautiful and the idea so ingenious that it seemed desirable to make founders acquainted with the method by which it was done. The description is taken from a paper published in the Journal of the Franklin Institute, June, 1887, and from letters written by Mr. Outerbridge.

It may be mentioned also that for this discovery and the amount of research connected with it Mr. Outerbridge was awarded by the city of Philadelphia (trustee of the John Scott Legacy) on recommendation of the committee of Science and Arts appointed by the Franklin Institute to investigate the merits of his discovery, the "John Scott Legacy medal and premium."

The report of this committee, which was

published in the Journal of the Franklin Institute November, 1887, itself shows original technical investigation on the part of the experts. The chairman was the late Chas. M. Cresson, M. D., a celebrated consulting and analytical chemist. The other members were Wm. P. Tatham (ex-president), H. R. Heyl (vice-president), I. Norris, M. D. (ex-secretary), Chabot Civil Engineer, Prof. Wm. D. Marks and Dr. Wm. H. Wahl, secretary of the institute.

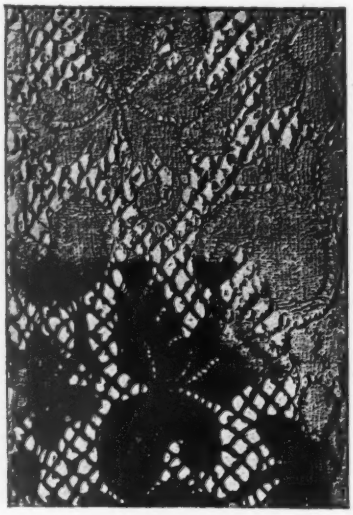

FIG. 1 IS PHOTOGRAPHED FROM A WHITE IRON CASTING UPON CARBONIZED COARSE LACE, THE LOWER PORTION OF THE PLATE SHOWS THE LACE IMBEDDED IN THE IRON.

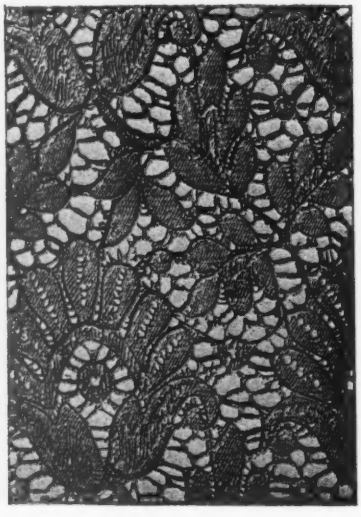

FIG. 2 IS A CASTING IN GRAY IRON UPON LACE LAID ON AN IRON PLATE.

FIG. 3 IS A CASTING IN HARD IRON UPON LACE LAID ON SAND.

We commonly regard charcoal as a brittle, readily combustible substance, but in car-

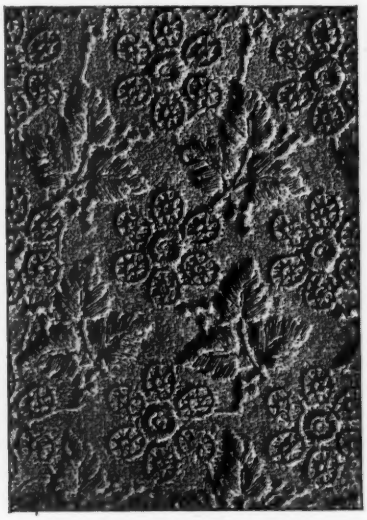

FIG. 4 IS A CASTING IN GRAY IRON UPON A PIECE OF THIN SUMMER DRESS GOODS WITH MACHINE EMBROIDERY.

bonized fabrics prepared by this process these qualities are conspicuously absent. A piece of carbonized cotton sheeting may be rolled or folded over without breaking, and, when placed in the flame of a Bunsen burner, the fibres may be heated white-hot in the air, and when removed from the flame, the material shows no tendency to consume. A piece of very fine lace, which has been similarly carbonized, displays the same qualities and incombustibility.

These carbonized fabrics may be subjected to a bath of molten iron without injury, which shows that they possess some qualities not ordinarily associated with charcoal. When removed from the mold in which they were placed after the iron casting had cooled, not a single fibre was consumed, but upon the face of the casting there was found a sharp and accurate reproduction of the design, thus forming a die. This die may be used for a variety of purposes, such as embossing leather, stamping paper, sheet metal, etc., or for producing ornamental surfaces upon such castings.

Some of the carbonized fabrics are almost

FIG. 5—WHITE CAST IRON DIE, MADE BY POURING THE MOLTEN METAL UPON A CARBONIZED DELICATE FERN FROND, FASTENED ON A PIECE OF MUSLIN; THE THREADS OF THE MUSLIN AND CRINKLES IN THE LEAVES ARE PLAINLY VISIBLE ALTHOUGH THERE IS VERY LOW RELIEF.

FIG. 6—CAST IRON CYLINDER. THE CARBONIZED LACE WAS HELD AGAINST THE FACE OF THE MOLD BY THE INFLOWING METAL AND THE DESIGN IS PERFECTLY IMPRESSED IN THE IRON.

The Hotel Walton is one of the finest Hotels on this continent, classing with the Waldorf of New York, Auditorium of Chicago, and New Planters of St. Louis. For this occasion they have offered to delegates in attendance at the convention accomodations at greatly reduced rates.

as delicate as cobwebs, and one would naturally suppose that when a great body of molten metal is poured into a mold in which they are placed, they would be torn to fragments and float to the surface even though they were unconsumed, yet such is not the case. In practice the most delicate fabrics may be subjected to this treatment without danger of destruction, and no special care is needed either in preparing the mold or in pouring the metal.

FIG. 7—CAST BRASS DIE. THE METAL WAS POURED INTO A MOLD FACED WITH A PIECE OF EMBROIDERED PIQUET (A THIN DRESS MATERIAL). SOME ACCIDENTAL FOLDS OR CREASES, IN THE FABRIC, APPEAR IN THIS CASTING.

The mold was made in "green sand" in the ordinary manner, and the fabric laid smoothly upon one face, being cut slightly larger than the mold, in order that it might project over the edge, so that when the molding-flask was closed, the fabric was held in its proper position. It is better to place the fabric on the side of the mold rather than on the bottom to avoid tendency to float. These castings are as sharp as electrotypes, whether made of soft fluid iron or hard, quick-setting metal. As the molten metal flows into the mold it forces the fabric firmly against the sand wall, and when the casting is removed, the carbonized fabric can be stripped off from its face without injury. In this way several castings can be made from one carbonized material, as the metal cools almost immediately, causing no appreciable destruction of the fibres.

Among the fabrics which have been used in molds and stripped from castings, is a piece of cotton sheetng, on which can be seen the black mark of a piece of lace laid upon it when the die was made, showing the lace and the cotton backing; the additional heat of the iron changed the color of the carbonized sheeting fabric where it was not partly protected by the lace threads. Watered silk carbonized reproduced the water-mark in the die perfectly, but silk has a tendency to become brittle in carbonizing. The piece of gauze veil is as light as a spider's web, but if you place it in a flame of an alcohol lamp, a Bunsen burner or gas, you will see the threads become incandescent, and even in the air they do not burn readily; when protected in a mold they do not consume at all.

The following is a very interesting and novel experiment. In this case, the piece of lace having open meshes a little larger than a pin's head, instead of being laid upon one face of the mold, was suspended in it in such a way as to divide it into two equal parts. Two gates or runners were provided, leading

We fear only one disastrous result of this Philadelphia meeting. Howard Evans, more instrumental than any other one man in forming the Philadelphia Association, the head and front of the movement having charge of the call and all the arrangements for the meeting, May 12, 13 and 14, is likely to be spoiled by the thousands of congratulations sure to be heaped upon him by those attending. Therefore, in the name of foundrymen everywhere, their associations and friends, in the name of the hundreds of personal admirers that gentleman already has and who wish to see preserved in all its freshness, that graceful charm of manner, that winning personality and unassuming disposition, we say Forbear.

from the "sinking head" to the bottom of the mold, one on each side of the lace partition,

FIG. 8—TOP OF CARDBOARD BOX EMBOSSED UPON A CAST IRON DIE, MADE BY POURING MOLTEN METAL ON EMBROIDERED PIQUET.

the molten iron was poured into the sinking head and flowing equally through both runners, filled the mold to a common level. The lace, which was held in position by having its edges imbedded in the walls of the mold, remained intact. When the casting was cold, it was thrown upon the floor of the foundry and separated into two parts, while the lace fell out uninjured, and the pattern was found to be reproduced upon each face of the casting.

The question naturally arises, why did not the iron run through the holes and join together? The answer may be found in the fact

FIG. 9—PIECE OF PICTURE FRAME MOULDING EMBOSSED IN A COMPOSITION MATERIAL FROM A CAST IRON DIE. (ACTUAL SIZE OF PATTERN.)

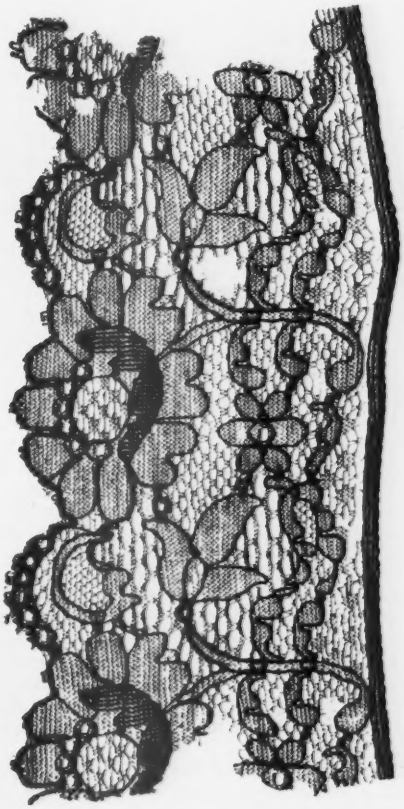

FIG. 10—PIECE OF CARBONIZED LACE UPON WHICH MOLTEN IRON HAS BEEN POURED AND A PERFECT REPLICA OBTAINED THEREFROM. THE FINE THREADS ARE NOT THICKER THAN COB-WEB, AND THE SAME LACE CAN BE USED AGAIN, THOUGH SLIGHTLY IMPERFECT.

that the thin film of oxide of iron or "skin," as it is popularly called, which always forms on the surface of molten iron, was caught in these fine meshes, and thus prevented the molten iron from joining through the holes. The meshes must be quite small (not over

one-fiftieth of an inch) otherwise the metal will reunite.

The process of carbonizing the delicate fabrics, leaves, grasses, etc., is as follows: The objects are placed in a cast-iron box, the bottom of which is covered with a layer of powdered charcoal or other form of carbon, then another layer of carbon dust is sprinkled over them, and the box is covered with a close-fitting lid. The box is next heated gradually in an oven, to drive off moisture, and the temperature slowly raised until the escape of blue smoke from under the lid ceases, the heat is then increased until the box becomes white hot, it is kept in this glowing condition for at least two hours; it is then removed from the fire, allowed to cool, and the contents are tested in a gas flame. If they have been thoroughly carbonized, they will not glow when removed from the flame, and the fibres may even be heated white hot before consuming.

By Mr. Outerbridge's process dies for embossing metals or leather can be made of cast iron that will reproduce the most beautiful and intricate patterns.

The photographic illustrations are reproduced from cast-iron dies, which have not been touched by a graver's tool and have had no hand work of any kind put upon them. The exhibit which accompanied the report of the committee of Science and Arts of the Franklin Institute (shown herewith), which was cast in the presence of the committee, is shown with the pouring gate and runner attached, just as removed from the mold, and a portion of the lace was retained—imbedded in the die—for the purpose of affording proof that these castings are made directly upon the fabric and not upon any plastic refractory material impressed with the design; this has often been attempted.

As an evidence of the adaptability of this process and its value from a manufacturing standpoint, we quote the following from a letter sent us by one concern, who have used Mr. Outerbridge's method in the manufacture of leather, this being only one of the very many uses to which it can be profitably put:

"We may say that we had constructed the largest steam press that up to 1891 had ever been built in this country, for the purpose of using dies 36 inches square. Our material having a very hard and inelastic surface is exceedingly difficult to emboss, and we found that electro plates of this size were not only very expensive, but showed the seam or line where various portions of the skins used as patterns were joined together, and that the sharpness of the surface patterns wore out very quickly in use. The cast dies which Mr. Outerbridge made for us were very much less expensive, more perfect in quality and infinitely more durable, being made of hardened bronze. We secured four of these dies, 36 inches square of various leather patterns, alligator, seal and morocco. We have embossed and sold on the alligator die some 40,000 square yards, which has gone largely abroad to Great Britain, as well as for domestic use, and of the small morocco grains for upholstery and general uses the product has been very much larger."

Notice.

Advertisements Entitled Situations Wanted, or Situations Vacant Will be Inserted in this column one insertion FREE All others 25 cents per line.

WANTED—POSITION as foreman in large or small foundry. Present place not satisfactory. Good references. Address box 11, care THE FOUNDRY.

FOR SALE—No. 3 Root Blower, used only few months. To be replaced with larger size. Address box 4, care THE FOUNDRY Publishing Company.

WANTED—a position as brass foundry foreman. Have had twelve years' experience as foreman and can give the best of references as to ability. Address box 14, care THE FOUNDRY.

WANTED—A young man capable of superintending plow factory having a capacity of 20 plows per day. Must understand business thoroughly. References required. Address box 18, care THE FOUNDRY.

FOR SALE—Foundry and machine shop in the City of Grand Island, Neb. New brick buildings on large lot. Plant well equipped with all necessary machinery and flasks. For full particulars address PHILIP M. WALES, Troy, N. Y.

WANTED—Position as foreman of foundry. Have had 15 years' experience, and up-to-date in all details. Manage a foundry on business principles and can give references as regards ability, habits. Understand gating small castings and able to estimate costs. Address box 17, care THE FOUNDRY.

WANTED—Foreman molder wants a situation. Has had 11 years' experience as such in marine and engine works. Has a thorough practical knowledge of green, dry and loam work. Used to handling men to advantage. Can give A1 references from last employers. Address box 16, care THE FOUNDRY.

WANTED—By an educated foundryman, 39 years of age, 25 years of experience, 15 years as foreman, superintendent and manager, a position in either capacity. Thoroughly conversant with modern practice on all classes of green and dry sand molding from the lightest castings up to 20 tons. Practical mixer and melter of irons, fair practical knowledge of chemistry of irons. Competent to buy material and figure estimates. References of the highest class. Address PAUL, box 12, care THE FOUNDRY.

The Effect of Atmospheric Temperature and Humidity on Melting Iron in a Cupola.

By A. SORGE, Jr., M. E.

That variations in the humidity of the atmosphere and its temperature do affect the operation of melting iron in a cupola, will be conceded by foundrymen who have observed the difference in melted iron on different days. Iron is liable to be cold and sluggish with the same charges of fuel on cold and moist days, while it is hot and fluid on warm and bright days.

It is therefore reasonable to look for one cause of poor melting to the atmospheric conditions. Let us assume that we are melting at a raito of 8 iron to 1 coke on an ordinary bright day, when the temperature is 62° F., and the percentage of moisture in the atmosphere about 0.52%, which is about the average in Chicago.

It has been found by experience that about 33,000 cubic feet of air are required to melt 2,000 pounds of iron in ordinary cupola practice. This air will weigh about 2,500 pounds, and is heated originally to a high temperature by the ignited coke before it becomes active in supporting further combustion. Also any moisture contained in this air must be brought to the temperature of the gases which escape from the top of the cupola. This latter temperature varies greatly, but will be in the vicinity of 500° F. for good practice.

If the temperature of the atmosphere should drop to 32° F. this means that the air delivered to the cupola must be heated 30°, so as to bring it to the normal. The specific heat of air being taken at 0.238, we obtain 2500×30×0.238=17850 B. T. U. as the amount of heat required to do this work, or theoretically about 1⅜ pounds coke would be consumed if we obtained perfect combustion. The fact being, that the actual amount of heat obtained from the combustion of coke in a cupola is only about ¼ of the theoretical, it follows that the actual coke consumed for this extra heating is about 5½ pounds, which should be added to the usual amount of 250 pounds per ton of iron, making 255½ pounds, or a ratio of about 7.8 iron to 1 coke.

If, at the same time, the air is charged with particles of moisture, as when a heavy snow-storm is in progres, it will contain, say, about 4-10% of frozen water. In the 2,500 pounds total, this will amount to 10 pounds, which must be transformed into vapor at 500° F., involving 14,740 B. T. U. of heat. On the other hand, this amount is reduced by the heat expended in raising the average vapor of 0.52% in 62° air to 500° F., which amounts to 2,714 B. T. U., leaving an extra amount of 12,036 B. T. U. consumed by the snow, which will again require about 3.6 pounds coke.

The total coke consumption in the above case will therefore be 259.1 pounds per ton of iron, or a ratio of 7.7 iron to 1 coke, in order to deliver the melted iron in the same condition as on an ordinary day. In other words, an additional fuel consumption of a little over 3.6% is needed under the above conditions, so as to obtain the iron in the same state of heat and fluidity as when ordinary dry air at 62° is used.

On the other hand, a higher temperature and greater dryness of the atmosphere will operate in permitting the amount of fuel to be reduced.

In the above figures I have assumed ordinary conditions, but the actual practice must be carefully taken into consideration wherever it is desired to figure out the effects in any particular case, and it is well worth a foundryman's time to go into this question, figuring out the extra amounts of coke needed under various conditions of moisture and temperature, when a short observation of an ordinary hygrometer and thermometer will enable him to avoid the risk of cold and sluggish metal on any day.

It is said that the largest single bronze casting ever turned out by a foundry in the United States was not long ago completed in a New York foundry. It is a colossal statue, 9 feet 6 inches in height, of Maj.-Gen. Charles Devens, the eminent jurist and soldier of Massachusetts and attorney-general in the cabinet of President Hayes. The statue was executed by O. L. Warner, of New York, on a commission from the city of Boston. Eighteen hundred pounds of metal were used in the cast. The mammoth statue of Peter Cooper for the little park in front of the Cooper Union, also made in the same foundry, was cast in two sections and consumed 3,000 pounds of metal.

Plumbago Facing.

By JOHN A. WALKER,
Vice-Pres. Jos. Dixon Crucible Co.

There is no literature on the general topic of Plumbago Facing. The dusting of powdered plumbago on sand molds to obtain smooth castings is a practice of recent date.

Asking a noted foundryman recently as to the general practice, he said there were as many different opinions as there were men; and as to ways of applying plumbago, he said no two men were alike. Some general hints will, therefore, be welcome.

You start with a sand mold; you desire a smooth casting. The old way was tumbling the casting, or pickling, or work at the bench with the wire brush or the emery wheel, or chipping. These four old-fashioned systems are tedious; they take time and are expensive and give poor results. The use of powdered plumbago dusted on a sand mold accomplishes nicely what tumbling, pickling, the emery wheel and chipping all fail to do.

Observing a foundryman dusting on plumbago, I asked the reason. He replied: Before knowing of the plumbago he took forty-eight hours to tumble his castings passably smooth, now 85 per cent. came from the mold to suit and the remaining 15 per cent. were tumbled smooth in four hours.

There are four leading branches of molding, viz: Plate molding, green sand work, dry sand work and loam and core work. On these several preparations of sand the molder desires to pour molten iron, and receive back a smooth casting of a perfect form and with a good color. Plumbago facing does this and is the only substance that will; without plumbago the molten iron cuts the sand, the casting is spotted with sand grains, the color is a slovenly yellow. With the plumbago the metal won't cut or burn; the casting lifts smooth and the color is the steely blue so much liked. It is the plumbago alone that secures the smoothness, that gives the color.

Its price is so low that enough to dust a large mold will not cost one-quarter of a cent. A good prepared article can be bought for six cents a pound, and one ounce, or one-sixteenth of a pound, worth two-fifths of a cent, will coat a large mold.

The Dixon Crucible Company, Jersey City, N. J., prepare two notable numbers, both selling at six cents—No. 604 and No. 2441. Both of these have records as long back as plumbago facing first came in vogue, and they are famous in many a shop of renown.

Plumbago is a carbon mineral. In the laboratory a good article, well-refined, will analyze 96 per cent. carbon. Its color is a silvery black. It is soft, smooth and unctuous to the feel. In the United States a notably good product is mined by the Dixon Company at their mines at Ticonderoga, N. Y. It is refined by the water process, then powdered to the necessary fineness.

Its characteristics are that it is absolutely inert; heat does not touch it, cold has no influence over it, acids even will not touch it, it has no shrinkage. These peculiarities are not put into it, but are its nature and are found in it. Its value as a facing comes from these peculiarities. Given a material that will stand intense heat or any change of temperature, successfully withstands gases and acids, is without shrinkage, and its value in coating a sand mold or core for iron casting at once is patent.

To coat the sand nicely, it is reduced to the finest powder and can be used through the shake bag, or put on by the brush, or, mixed properly, makes an ideal core wash.

Another breed, so to speak, of plumbago, the notable flake variety, is the best lubricant known. It is an anti-friction agent of the first rank. Still another form is used as a pigment for a preservative paint, suitable for all metal and wood surfaces.

Plumbago is thus the foundryman's best friend. To buy it right is a fine art, as it is easily adulterated. No better rule can be given than to consult miners of renown, houses of prominence and integrity.

The Western Foundrymen's Association.

The regular monthly meeting of the Western Foundrymen's Association was held Wednesday evening, March 18, at the Great Northern Hotel, Chicago, Ill. The president, John M. Sweeney, occupied the chair.

The secretary read a letter from the Foundrymen's Association of Philadelphia, requesting the Western Foundrymen's Association to join them in a call for a national convention of foundrymen to be held in May. The secretary stated that the letter had been

laid before the Board of Directors and the board recommended to the general meeting the following resolution:

Whereas, This association has been requested by the Foundrymen's Association of Philadelphia to join in a call for the "first national convention of foundrymen," to be held in Philadelphia, May 12, 13 and 14, 1896; therefore be it

Resolved, That in view of the fact that the Western Foundrymen's Association has no control of the arrangements for this national convention, it is the sense of this association that the joining in this call should be confined to members of the association only as individuals; and

Resolved, That the Western Foundrymen's Association requests its members to attend the convention; and

Resolved, That the secretary be requested to send the names of those individual members who desire to sign the call for the convention to Mr. Evans, secretary of the Foundrymen's Association of Philadelphia.

On motion, duly seconded, the resolution was adopted.

THE APPRENTICESHIP SYSTEM.

The president then announced that the discussion of the evening would be upon question No. 4, which reads as follows:

"4. Is it desirable to have a recognized apprenticeship system, and if so, what is the best form?"

The secretary read a communication from Martin Fox, president of the Iron Molders' Union, as follows:

"One of the most prolific causes of friction between employers and labor organizations, next to the wage standard, is the apprenticeship question; and one of the chief reasons that this does cause friction is the lack of a binding, comprehensive apprenticeship system. It should, I maintain, be the aim of an employer to see that the apprentices under his care become the best mechanics their capabilities will permit. It should be his pride, his boast, that after leaving his establishment they are capable of holding their own as mechanics, and are a credit to the shop in which they served their time. Agreeing then that this should be the ruling motive of an employer in his dealings with a boy, we must admit the necessity for a definite period of tuition in which his powers may fairly be said to have been developed. It might be urged that some boys are so much brighter than others that it would be unfair to require from them the same length of servitude that it is neessary to exact from another. But while I admit the superiority of some apprentices, I believe it possible to strike an average suitable to the general necessity. Having done so, we establish on the one hand, a period to which the boy will look forward to with hope, and on the other an incentive for him to make the most of his period of probation, knowing that after its expiration he must be prepared to assume all the responsibilities of a master mechanic. From long experience and after thoughtful consideration, I would urge the necessity of a specified agreement or indenture, having the force of law, between the employer and the boy's guardian; the former undertaking to give the boy every opportunity to learn his trade, and the other guaranteeing continuity and fidelity of service during the time specified. In too many instances the boy is used to further his master's monetary end, without regard to his future. So long as he fills the requirements in this respect he is retained and may eventually become a competent mechanic; there are odds against the boy. On the other hand, an employer is often taken advantage of by a headstrong, wayward boy, who having in his opinion acquired a proficiency, grows restive under some of his fancied disabilities, quits his job, loses to the foundryman the time and trouble devoted to his earlier instructions, and goes out into the world a "botch" mechanic. Under a proper apprenticeship system, upheld by both foundrymen and the organizations of their mechanics, these evils would be reduced to a minimum, the general welfare of the industrial community improved, and the standard of skill of the American mechanic raised to a point more in keeping with our national preeminence."

A communication was also read, as follows, from Eugene W. Smith, of the Crane Company, Chicago:

"It is desirable to have a recognized apprenticeship system. It is a well-known fact that where the boy is apprenticed to the trade, very often the enforcement is not only distasteful to the boy, but unprofitable to the employer, thus working an injustice in both cases. Now, to overcome this, I think that

no agreement should be made with any boy who has not worked at least one year in the foundry. By this time he will be able to determine whether he wishes to learn the trade and his parents or guardian will be able to decide whether it would be profitable to have him continue, and the employer will also know whether he is likely to become a good mechanic. Having decided to enter him to an apprenticeship, the term of service should be at least four years, one of which should be put in the pattern department. He should not only be taught molding properly, but he should also be taught how iron is mixed and melted. If he had started in at 15 years of age, at 20 he will have learned his trade thoroughly, and has had the proper education which should fit him for foundry practice and also place him in line for promotion should occasion require. As it is at present, the training school is the only source of supply for the future foundry foremen."

The following letter was read from John Gotham of Keeley Foundry & Machine Company, Goshen, Ind.:

"A recognized system of apprenticeship would be very desirable, provided the system could be made general, and even if not general, it would be a good thing for the boys. My idea of a system would be to apprentice a boy for four years, divided as follows: The first year is spent in the core room. The second year give him no regular work, but use him for all purposes around the foundry, more particularly about the cupola. Let him become familiar with machinery about the foundry. The third year give him a floor on easy work and the fourth year give him the best work in the shop. During his second year I would allow him to do some molding and help molders on large pieces. With such a system a better molder could be turned out than the average man with ten years' experience. The system would be beneficial to the employer as well as the apprentice."

Clement Bush of Quincy, Ill., wrote as follows:

"In my opinion a recognized apprenticeship system in this country is badly needed. In the first place, I would have an apprentice serve from five to six years—viz., six months at cupola, one year at core bench, three and a half to four and a half years at molding. I also would have the employer teach the boy the trade as much as lay in his power. I am also in favor of reducing apprentices' wages, so that the employer can be paid for his trouble in teaching the boy his trade. In my 45 years of experience, I find that I cannot change men from one job to another for lack of experience."

The following communication was read from Thos. D. West:

"First divide our trade into three branches: Machinery, stove plate and bench molding. For heavy work, shops that do loam molding in connection with green sand, have the term of apprenticeship five years. For all strictly heavy and jobbing greensand shops, four years. For shops doing light machinery, three years. For bench molding specialty shops, two years.

"In starting a boy, give him a trial of six months, and if found not to possess mechanical ability, let him go; otherwise, at the end of this period bind him to finish his time, and on completion of the term have the employer sign an apprenticeship certificate, certifying that he has faithfully served all his time, specifying an actual number of days, which will be understood as meaning that if the boy lost any time through sickness or otherwise he has made it up before the certificate is tendered him.

"Before permanently binding the boy to an apprenticeship, have him furnish three advisers or backers, consisting of one skilled tradesman, in or out of the shop, one business man, having a reputation for intelligence and integrity, and a family physician or another business man to sign the articles of agreement furnished by the proprietor, something after the following character:

" 'We, the undersigned, do hereby agree to endeavor to arbitrate all grievances whether for the employer or apprentice, and use all just influence to have right prevail on both sides, and if satisfied by facts that justice is not being accorded the apprentice, he can then be released from all obligations of his contract by any two of his backers signing the blank release attached to the main contract for that purpose. After such an act on the part of two advisers, the boy is then at liberty to engage with any founder should he desire to do so, in order to finish his time. It being understood that six months is to be added to the total time first called for in the original contract on account of each change, in order to permit the boy time to make up

the progress lost by the change in getting the run of a new shop, its work and men.

"I would grant the employer the full right to discharge an apprentice at any moment, should he for any reason feel justified in doing so. I am well aware that there are those who would argue that an employer should be bound the same as the apprentice in requiring two signatures of the boy's backers before the employer should have the power to discharge an apprentice. To have such conditions prevail would defeat the very object desired to be attained, which is to bring every possible factor to bear in influencing the apprentice to labor earnestly to learn his trade.

"What control could a foreman or proprietor have over an apprentice if the latter knew he could not be discharged without the consent of his advisers. All will agree that employers are generally desirous of retaining an apprentice as long as they can, especially so when he becomes proficient.

"Should the employer find that the boy will not follow instructions which he thinks to the boy's interest or his own, he can then counsel with one of the advisers, who, in turn, can have an interview with the boy, and if necessary call in the aid of the other two advisers, to use their influence to have the boy do what they think right. But upon investigation, should it be found that the employer is unreasonable in his desires and cannot be prevailed upon to do what they think just, the above provisions then permit their releasing the boy from his contract with the employer and give him freedom to engage with any other firm.

"There are two points upon which the employers and advisers could seriously disagree. The first would be wages and the second the amount of work. The first could readily be agreed to in the contract, but the second, we must admit, would in many cases, be a question occasionally requiring adjustment. But if the advisers will remember that it is to the boy's own welfare to learn to give quantity with quality, and if the employer will be reasonable in his demands in managing his apprentice, so as to retain a boy to the end of the contract, there would not be any great difficulty in satisfactorily adjusting any disputes on this point.

"The burden of such a system falls chiefly on the shoulders of an employer, but nevertheless, I believe most employers stand ready to do almost anything to secure conditions which would admit of making all apprentices good, skilled mechanics. Some will say that they do not perceive where such a system would place any burden on the employer, as employers stand to-day largely independent in regard to the treatment of apprentices, as no one takes any interest in them nor is any special provision made for their general welfare and future success. The employer is now free to use his own judgment in advancing his apprentice, as regards perfecting him in all the branches of his business, whereas, were there such a plan in vogue as this paper advocates, the employer would, in a sense, did he not "give the boy a show," have three overseers to consult with every apprentice he might employ, so that employers having 30 apprentices would have 90 sub-bosses, who would be running to them at any time the apprentice might think his sensibilities touched in the least. This is the radical way to put it, but the common sense way which could be easily followed is for the apprentice to treat with his employer as far as he is able to do so himself and only as a last resort to call in the assistance of his backers. Then only in rare cases would it be essential for more than one adviser to confer with the employer ,as he could generally well voice the opinions and desires of the other two. The knowledge that there were those who would be after an employer did he not do right, would cause him to travel pretty straight in his rulings, and if the boy used half reason there should be very little or no trouble.

"It is reasonable for a boy to think that when he can become sufficiently competent to do good work as well as he may see some 'would-be molders' turning it out he is thoroughly qualified to start out as a journeyman. As many think it i snot to the interest of the 'would-be mechanic' to have skill created which can surpass them, it is evident they are not going to advise or assist an apprentice to achieve greater skill than they possess, nor are the few truly highly skilled workmen over-anxious to aid them. It is this influence in conjunction with haste of the boy to be receiving man's wages that tend to his not being content to give the time he should in order to become a thoroughly skilled mechanic.

"All good citizens should labor to change

the present conditions, so detrimental to the welfare of the poor sons of the mechanics or laborers who are generally desirous and ambitious to make themselves valuable, skilled men, and generally would do so were they not misled by false representations, bad examples and distrust which prevail among many men.

"With a board of disinterested, industrious, intelligent men to advise and influence a boy, also to see that he is permitted every chance to thoroughly learn to do a shop's work, I fail to perceive why the boy should not then be placed in a position to discover the sophistries so detrimental to his own interest.

"Thirty to 70 years back the boy had little need of influence to direct him to finish his trade. In some cases he had to do so or go to jail; he was not given the freedom which the boy of to-day enjoys, nor was he in the position to feel the sacrifice of the independence so bred in our American youth.

"We cannot return to the old laws and usages of training the true mechanic. The advancement of the age calls for an entirely different plan to create highly skilled labor, and while we may be able to educate in less time than in the past, we cannot ignore the fact that to create skill requires more time than is at the present day expended."

W. Ferguson, Chicago: In order to perpetuate any business, it becomes necessary to school the succeeding generations. This applied to the foundry means we must have a thoroughly practical apprenticeship system if the molders of the future are going to be superior mechanics to those of the past, and they necessarily must be in order to meet the demands placed upon them. As there is no place quite so good to make molders in as the foundry, I fail to see how it can be otherwise than desirable to have a recognized apprenticeship system. Some may argue that the result can be accomplished by specializing, but foundry work is of such a growing and diversified nature that it is not practical to follow this system only on special lines. In the majority of foundries there is not enough special work for any given length of time to make it possible to keep one man on any one piece, or even pieces of similar character. This is true even in foundries making specialties in connection with general work.

Under such conditions it becomes necessary to have what we term general or all around molders. We must have molders who have been so schooled in the various branches that they can produce a good casting from any pattern given them, and often without patterns. They must be able to do it without having to serve their apprenticeship on each special piece at journeyman's pay before they succeed in making a good casting, as is too often the case at present. If we do not make molders for present or future use, how can we expect to continue the business? Some will say we have got along fairly well so far, and there has been no apparent scarcity; but is it not true that we have been supplied by molders who have served an apprenticeship in foreign lands, where they have a thorough system and mostly by indenture? It is safe to say that two-thirds of the best molders working in America to-day are of foreign origin.

The common way of making molders in this country consists in engaging a young man for that especial purpose and then allowing him to catch on as best as he can, with the result that, at the end of three or four years, he is turned loose on the community without knowing even the common rudiments of the trade. Another way is to put a laborer to make some special piece and keep him at it until he becomes expert. If this job runs out he is possibly tried on some other piece, and, after a few such changes, this man imagines he is a molder and can get more money working elsewhere and he starts out looking for a position. He gets a job in course of time, and as soon as he makes a start the foreman knows, from past experiences, that this fellow is not much of a molder, but being willing to give the new man a little chance to become familiar with the shop and tools he lets him alone, the result being that this man gets a few days' experience (the thing he is after) and the boss gets grief and scrap. And so this fellow goes from place to place until he has finally picked up enough knowledge of the business to enable him to hold a position, receives going wages and calls himself a molder. But this is not making mechanics legitimately.

The system I would advise in the making of molders or foundrymen would be based on a contract for a term of four years under good, rigid discipline, at stipulated wages for each separate year, with certain requirements to

be accomplished in each year before the apprentice would be entitled to advancement. I would advise a premium for those filling the requirements before the stipulated time. A small retainer from each week's pay as a guarantee of good faith is advisable. The contract should not only state the requirements to make the apprentice a mechanic, but it should also contain some clause looking to his deportment and moral conduct, and certain requirements should be called for from all applicants, such as age, education, general health, physical ability, etc. This having been attended to and the applicant accepted, it should then be the duty of the firm to give him all the opportunity possible to make him the desirable man and mechanic they would be pleased to have in their works. When both parties are schooled to work with that end in view, it surely must follow that a superior class of mechanics will be the result, and self interest with the manufacturer must soon make the adoption of some practical apprenticeship system a necessity.

J. M. Sweeney: It is a good thing in arranging an apprenticeship system and in arranging the wages that are to be paid, to leave the last year's wages of the term undecided, with the understanding that the last year's wages will be based on the value of the work. That makes an incentive for one apprentice to excel another.

John Pettigrew: For a good many years past it has been our system in Joliet to bind the apprentices. It used to be the system to bind them for four years. The apprentices that were bound for four years thought that they were imposed upon, and the consequence is that the apprentices in the molding shop are only put under a three years' binding. The first year they were paid 50 cents a day; the second year, 75 cents a day; the third year advanced to $1 a day and the fourth year $1.25 a day. When the fourth year was up, if the boys had fulfilled their contracts and the foreman thought it advisable they got $100 premium. In the machine shop they were paid $100 premium at the end of the third year, and that caused a good deal of feeling. Since that has been introduced it has been my custom to rate all of the boys as near as I could on that basis; but I like to take the apprentices on as helper for a limited length of time until I can see what they are worth, then I put them on the apprenticeship system. I find that it works exceedingly well. The apprentice can find out whether he is willing to go on and learn the trade of molding or whether he thinks it would be too hard work and wants to drop out. During a part of the time I put them on as helpers for some of the core makers, the other part of the time I put them into cupola work, so that I can fall back, if necessary, on having a competent cupola man. I might say that out of some 35 or 37 molders trained since 1875, I have three-fourths of my apprentices as mechanics. They are men I can put on any kind of a job I want to get out and depend on getting it. I can depend a good deal more on getting the work sure and good than I can with old country molders, who have spent seven years as apprentices. I have some now that have only been three years at the business and they would class against first-class traveling molders—tramps, as I would call them. The binding of molders—something like Mr. West's recommendation—is a good thing. We must depend on the men we get in country towns. Last year I took a trip to the East, and in visiting in Youngstown I saw the Lloyd-Booth Company. They had a great complaint to make about the class of molders they had to employ. I made the suggestion that they raise the boys in their own town to do the work. It seems that had never been thought of. Why not raise up our boys to this business?

Mr. Sweeney: Have you had any security that the apprentice would stay his time out?

Mr. Pettigrew: Only the $100 at the end.

A. Sorge, Jr.: I would like to ask Mr. Pettigrew how many apprentices he has trained in that time?

Mr. Pettigrew: I have trained over 60. Some of them have made good men and are working now in Chicago. Since the $100 premium has been in force we have not had one desert us.

A. Sorge, Jr.: I think it is certainly a very desirable thing if we can obtain an apprenticeship system which shall be universally recognized and in which each manufacturer shall be equally interested. The only difficulty is that the selfish manufacturer will allow the unselfish and generous one to have all the trouble of educating the apprentice and then take the profit and advantage of

this education. If a set of young men are trained in the proper way the valuable portion of their services comes after the training and the benefit of the service cannot be secured because they cannot be kept. Mr. Pettigrew has trained about twice as many men as he has retained. I think the conditions at Mr. Pettigrew's shop are better than they are in Chicago. In a small place like Joliet the boys stay in the shop a greater length of time than in a large city. In Chicago there would be considerably more shifting of these young men after they have served their time. It would be a most desirable thing, but I fear that in getting up such a system, although it would be an ideal one, the selfish manufacturer, whose sole and only aim is to get the greatest amount of labor for the smallest amount of pay, would get all the advantages.

Mr. Pettigrew: When I served my time in the old country, no man could work in any part of Scotland without having served seven years as an apprentice. He had to work that seven years to get his proper papers from the firm that he worked with. As far as I knew, all the foundries in the old country up to the time I left it—30 years ago—had no trouble with their molders. If they did not become good mechanics the union would not keep them and the firms discharged them just the moment they did not do their work properly. One bad casting might be excused, but the second one would not.

Mr. Sweeney: I would like to ask Mr. Pettigrew to how many of the men who finished their apprenticeship did you pay the $100?

Mr. Pettigrew: Every apprentice but one within that time.

Mr. Sweeney: Was there any difference between them?

Mr. Pettigrew: Yes.

Mr. Sweeney: Then some would be entitled to more than $100.

Mr. Pettigrew: Unquestionably I would give some a good deal more than the $100.

A. Sorge, Jr.: How many of those that were trained in the last seven years and are still with you received the $100?

Mr. Pettigre: About five. I have got something like 26 of my own apprentices now that I would not exchange for any men.

Mr. Sweeney: Mr. Sorge's objection to the apprenticeship system of this time is that it will not be equitable, because all shops will not take boys. To some extent this will take care of itself.

H. S. Vrooman: I served an apprenticeship and I had to furnish bonds that I would serve my time. Mine was piece work and the first year I got 60 cents on the dollar, the second 70 and so on. After the third year I was considered a mechanic and got full wages. I do not see how any rule could be laid down whereby all apprentices could be governed alike.

E. E. Hanna: I have schooled but a few apprentices, but I do not remember any one who served his complete time that I did not make money on during the time of his apprenticeship. I do not see why an employer should pay an apprentice during his apprenticeship as much as he earns. I do not see why the apprenticeship system should not be a paying thing to the employer as well as a profitable arrangement for the apprentice. It is with me simply a question of whether I have the room and the chance to properly instruct more or less apprentices.

The majority of the American boys have had a free school education and are not willing to serve an apprenticeship. They want to do something a little cleaner. We must get our apprentices from a class of boys who have not had the advantage of an education. It is a great deal more to the advantage of the employer to fit his apprentices to fill any posts that he has around his place. In other words, to give him during his apprenticeship help in educational lines as well as in manual dexterity. If the concern is large enough to do so they should have a night school during certain parts of the year. I believe in apprentices and the apprenticeship system, and I believe there should be an agreement between employer and apprentice, because I think it is simply a good business proposition for every employer to have his apprentices.

Mr. Ferguson: The only thing I see in favor of the organized apprenticeship system is an agreement as to the term of years and wages paid for the services, so that there should be no dissension in some shops on these lines. I have had a good deal of trouble with boys that I have started in to make molders out of at small wages, because there are other shops which pay $1 a day.

A. Sorge, Jr.: Mr. Hanna states that he could put in apprentices if he had the room,

place and opportunity to train them. I should judge from that remark that if Mr. Hanna were crowded with work so that his room was limited, he would think it more profitable to put journeymen in the place occupied by apprentices.

W. Ferguson: I do not think we have anything to fear from what Mr. Sorge spoke of on account of the selfish manufacturers getting the benefit of the apprentices trained in other shops. Allowing that the good mechanic leaves the place where he served his apprenticeship, he is going to be a good mechanic whether the other fellow gets him or not. It should not be put in the light of a charitable act of the employer to school and educate an apprentice to become a mechanic. I think it is a business proposition and a necessary part of the foundry, just as much as to have power to run the place.

A. Sorge, Jr.: I would like to have Mr. Vrooman tell us his experience in working by the piece and whether he was not making journeyman's wages and turning out worse work.

H. S. Vrooman: Where the piece work system is employed the apprentice learns to be a hog more than he does a mechanic. The piece work system is not the proper one by which a mechanic should learn his trade.

Mr. Pettigrew: If I were a very selfish employer, most undoubtedly I would never have an apprentice at all. I would look to my own best interests and see that I had nothing but the very best workmen. That might work well for a little time, but where would I be in the future, having to depend upon fellows that come from such shops as Mr. Vrooman speaks of?

O. T. Stantial: I have had no experience with apprentices in the foundry, but in our pattern and machine shops we have a system that works very well. We take the boys first for a few weeks to see what they have in them, and if they are adapted to the pattern department or machine shop, then we make a contract with them for three years, so much for the first three months and advance them each three months until the end of the third year, when they are getting $8 per week. The salary for the first month of each year is held back, but if they stay their full term of three years the money that is held back is paid to them in a lump sum. It amounts usually to something between $50 and $60. I do not remember any apprentices quitting or breaking their contracts in the last four years under this system.

E. E. Hanna: I, of course, believe in a binding contract with some monetary consideration to induce the parties to serve their full term. As to a man leaving at the end of his apprenticeship, I cannot find any fault with that. The best men that I have had anything to do with have been tramps, as Mr. Pettigrew calls them. I might say that I have been a tramp myself, having worked in 30 different states. I mean the man who is going over the country and catching on to new ideas, and is willing to use those ideas for the advantage of his employer. He will be a mechanic. It is a part of his education. In all probability, when he is ready to settle down, he is just as likely to go back to the first shop in which he worked as to go to some strange shop.

W. Ferguson: I move that a committee of three be appointed to draw up a set of indentures and to submit them to this association at some future meeting.

A. Sorge, Jr.: I would like to offer an amendment that the committee be instructed to draw up a plan for an apprenticeship system including a set of indentures.

After being duly seconded, the amended motion was carried. The chairman announced that he would name the committee later.

James Chalmers.

The History of a Tramp Molder.

W. EDWARD.

CHAPTER XXV.

It was not very long before one of them pulled out a greasy pack of cards and proposed a game of pedro to pass away the time. I took a hand and we played for some time, when one of them accused me of cheating. I gave him the lie, when he struck at me, and in less than a minute we were all four mixed up in the liveliest kind of a scrimmage. I backed up into the corner of the car, pulled out my trowel and defended myself the best I could, but they were too many for me and one of them gave me a rap over the head which brought me to my knees, while another caught me

behind the ear with his fist, which laid me cold. When I came to my senses I found myself lying at the foot of a steep embankment alongside of the railroad, where I had evidently rolled after being thrown from the train, with nothing on me but my underclothes, having been robbed of my money and clothes and even my shoes. My eyes were bunged up so that I could hardly see, and I had been kicked and pounded until my whole body was a mass of bruises and I was so sore I could scarcely crawl. It was a sweltering hot day, and to add still further to my discomfort the mosquitoes almost eat me up when I crawled under the shade of a tree to get out of the glare of the sun.

I lay there for three or four hours, not knowing what to do and being too sore and faint to make any exertion, when, just as the sun began to get low, and I had made up my mind I would have to stay where I was for the night, I heard the welcome sound of a hand-car coming up the track. As soon as it came in sight I stood up and called to the men to attract their attention, and then commenced to crawl up the bank. As soon as they saw me the car was stopped and two of the men helped me up on to the railroad. Then I told how I had been beaten and robbed and thrown off the train. The foreman said he would take me to the section house, where the "old woman" would soon fix me all right, while the rest of the men volunteered clothing enough to cover my nakedness. When we got to the tool house I waited there until the men went up to their houses and brought me down coat, pants, hat and shoes, and then helped me put them on and half carried me up to the section foreman's house, for I was so badly used up that I could scarcely stand. The section men were very kind to me and insisted on my staying until I was in fit condition to travel. On the third morning the foreman and three of the men took me on the hand-car up to Noble, which was about ten miles up the road, and after bidding them good-bye I made another attempt to get to St. Louis.

I waited all day for a chance to get out of Noble and it was not until nearly midnight that I caught a train going north. The section foreman had loaned me a dollar to get something to eat on the road, and this I promised to return with the clothes as soon as I struck a job. I looked the typical navvie in the rig I wore, and I imagined the laughter it would create to see me walk into a shop and strike the boss for a job. I had on a stout pair of brogans, a size too large for me, a pair of blue overalls and a red flannel shirt, an old-fashioned black broadcloth coat and a wide-brimmed straw hat. My tools and my card had gone with my clothes. I hadn't a thing about me to identify me as a molder, and I began to wonder if any foreman would give me a job in such a rig. The Iron Mountain is a pretty hard road to get over, as most of the brakies are "out for the stuff," and if they can't work you for anything you have to "hit the dirt." Along about midnight I caught a train and stowed myself away in a box car, but we hadn't made more than twenty miles until the car I was in was switched off on a siding. I swung off and run back along the train to find another empty box. Just as I found one and had climbed into it, a brakeman, who must have seen me get on, came to the door and asked where I was going. "To St. Louis," said I. "Have you got any stuff?" "No, not a cent in my clothes." "Well, my covey, you'll have to count ties," said the brakeman, "we don't carry no bums on this road 'less they pays duty." I told him how I had been robbed and thrown off the train, and showed him my bruised face and the clothes the section men had given me as proof of my story, but he only laughed and told me to get off, or he would lock me in the car and turn me over to the railroad detective when we got to Poplar Bluff. I knew he would make good his threat, so I jumped out and walked up toward the head of the train.

The train had stopped at a little station and the engine was taking water. I felt relieved when I saw the tank and gave up my idea of catching that train when it commenced to pull out, as I knew other trains would have to stop there for water and I would have a chance to get out without walking. As soon as they finished taking water the signal was given to go ahead, and the train pulled into a long siding to clear the track for another train.

I made up my mind to jump the first train going north, no matter whether freight or

passenger, providing it stopped there, and I had not long to wait until I heard the rumble of a train and the night express for St. Louis came to a stand at the water tank. There was no blind baggage and the express messenger stood at the door of his car, so there was no show there, and I knew there was no use getting in the passenger cars, as my rig was too noticeable. The only other place I could think of was the pilot of the engine, and I made up my mind to try that. While the fireman was watching the water and the engineer was oiling his engine, I watched my chance and climbed up on the pilot, turned sideways and braced myself between the stayrods of the boiler. It was quite dark there under the glare of the headlight and there was not much danger of my being seen. I rather enjoyed this at first, but as the train gathered headway the engine began to rock from side to side and the roadway seemed to be rushing down on us so fast that I was fearful of it rushing up over the pilot and crushing the life out of me. It did not seem to me that we were running at all. The engine just seemed to stand still and rock from side to side, while the roadway came tearing down on us so fast that it made my head swim, and this sensation was so strong that I had to close my eyes to shut it out.

It made no stops until we reached Poplar Bluff, and I thought I would be seen and put off there, as two men stood on the platform and appeared to be looking directly at me, and the engineer came around to oil the guides so near me that I could have reached out and touched his head, but I was not disturbed and the train pulled out again. We made a dozen or more stops before we reached Carondelet, but I stuck to my perch without being seen, although for the last ten or twelve miles it was broad daylight, but it was so early that there was no one on the platforms of the stations we passed. When the train pulled up at Carondelet I jumped off, as I thought it would be a little risky riding into the union depot on the pilot.

I had never been in St. Louis before, and didn't know where the shops lay, but on inquiring at the restaurant where I got some breakfast I was told that the Vulcan foundry was located near there, and that it was a good place to work in. So, after breakfast I went over to the Vulcan and tackled old John Robinson for a job. He was walking down the gangway with a straw in his mouth and humming a lively air. I saw all the fellows watching me, and I guess they were wondering what I wanted with the old man, as none of them suspected me of being a molder. When I asked John for a job he looked surprised for a moment, took the straw out of his mouth and said: "I'm sorry, my boy, but the wheat's all thrashed, the hay is all harvested, we laid the corn by last week, and there won't be anything doing until husking time."

"Oh, come off," said I, "I'm no farmer. I want a job at molding."

"A molder, are you?' said he. "Well, well, who would have thought it." Then held his sides and laughed till the tears came to his eyes.

The fellows who were working near and heard the conversation joined in the laugh, and in a minute or two all the men in the shop began to gather around to see what the fun was about. Old John came at me again: "How do I know you're a molder? Have you got your tools with you, and where's your card?" The whole crowd joined in the laugh which followed, and I made no attempt to answer old John's questions.

Turning to the men, I said: "Now, if you fellows will kindly go back to your work I think I can persuade the old man to give me a job on the floor until 'husking' time, and then you can have fun with me every day." Then I turned to old John and told him all the trouble I had been in, and asked him if he wouldn't give me a few days' work at least, so that I could pay the expressage on my grip and get some decent clothes to wear. He said they were not overly busy, but he would give me a job for a week to help me out, and, if I wanted to, I could go to work at once.

I signified my willingness to go to work at once by peeling off the old black coat the red flannel shirt and rolling up the sleeves of my undershirt. Old John handed me a shovel, pointed out a floor in the corner and started me in on mill spindles and boxes. The word passed around that the "farmer" had got a job, although work was so slack that some of the boys were afraid of being laid off, and "Farmer" was the only name I got while I stayed there.

It was on a Saturday morning when I went to work, and that evening I got "Jim" McGrath to lend me a dollar and a half and got him to go with me to the express office to get my grip out, because I had lost my receipt and didn't know whether they would give it to me without being identified. I tried "Dick" Powers and John Fitzpatrick, but "they wasn't taking any risks on hoboes that they didn't know nothing about. Well, I worked for old John until the following Saturday night, when he told me he would have to lay me off, but said if I didn't strike a job within the next couple of weeks to come back and maybe he could put me on.

When I got my money the first thing I did was to pack up the clothes I had borrowed from the section men and send them, together with the dollar he had loaned me, back to the section foreman. On Monday I went up to St. Louis to see if I could strike anything, but I had no luck. I went to Timmerman's first, where the foreman treated me very nicely. He wasn't hiring any men just then, as work was kind of slack, but told me to come back in a week or two if I didn't strike anything in the meantime. Then I went to Duetroe's, Allen's and the car wheel shop, but they were all slack, and I began to think I would have to take the road again. I had often heard of Jake Hart and the curious specimens of natural history which he had gathered around him at the Missouri Car and Foundry Company's shop, or the "Mizzou Penitentiary," as most of the hoboes call it, and as a last resort I went over and tackled Jake for a job. I had on a new suit of clothes that I had bought just before I left Memphis, and I guess I looked too new for for him. "What kind of a job d'ye want," said Jake, sizing me up, "superintendin' the shop?" "Oh, no," said I, "I wouldn't be guilty of running a shop like this. Just give me a job on the floor; but I don't want any car work." But Jake wouldn't give me a job. Said he hadn't any use for dude molders, but wanted men who could "hump" themselves and do a day's work; and I thought by the humps some of them wore that Jake had a crowd which suited him.

Queer stories they tell about some of the old-timers in the "Mizzou Penitentiary." There was one man, it is said, who worked on the same floor for nine years, and never knew there was a skylight over his head until Jake fired him for making more money than he (Jake) was getting. You see, he started in before daylight every morning and worked until long after dark every night, and he never had time to raise his head to see what was above him. After Jake fired him, although he was well off and could have lived comfortably without working, he just hung around the shop brooding over his trouble until he died of a broken heart, and the men in the corner of the shop say that Charley's ghost still haunts his old floor.

Then there was another character there, by name Jesse Walker, a "plug" molder, who managed to put in about fourteen hours out of every twenty-four in the shop. It was said that the company gave Jake orders to keep Jesse on steady and on no account to fire him, because, on account of the high price of scrap, Jesse could make it cheaper than they could buy it. Jesse was so industrious that he spent the most of his time at home of nights making wooden slivers, so that he wouldn't have to stop and hunt for nails during the day. He was economical, too—wouldn't let his wife buy any kind of meat but corned beef and rib roasts, because the skewers with which the butchers fastened the meat came in mighty handy for carrying deep pockets. On his way home from work Jesse had to pass a brickyard, and, it is said, he carried home enough bricks, two or three every night, to build himself a four-room brick house. Jesse got into the habit of carrying so many things that the police got onto him, and one morning, about five o'clock, while on his way to work, he was arrested on suspicion of being a burglar. When searched at the station house, in addition to his tools, which he carried home regularly every night and brought back in the morning, they found in his pockets three wedges, a long clamping bar, which easily could have been mistaken for a jimmy, and three pieces of candle. This would have been enough to convict him had he not been able to establish his identity.

"Bad" Jack Ryan was another notorious character who was raised in the "Mizzou," but he only worked there periodically. Jack

was one of those fellows who only worked in order to buy whisky enough to give him strength to earn money enough to enable him to buy more whisky. He and Jack Manning would have been a good pair to draw to, with this difference: that while "Bad" Jack could never tear himself away from St. Souis, Jack Manning is known from Duluth to New Orleans and from Chattanooga to Denver. It is said that on one occasion, when the thermometer was down to zero, "Bad" Jack came into the shop entirely naked, except for a mismated pair of shoes, an old straw hat and a long linen duster, with a stone in each pocket to keep the wind from blowing it over his head. This suit had been donated him by some friends after having been robbed of his own apparel by a crowd of bums who hang around Tom Allen's "Champion's Rest." "Bad" Jack was in bad shape, and he knew that a linen duster wasn't going to keep him warm, no matter how much liquor he carried. Staggering up to Jake, he said: "Jake, gi'me a job; an' I wants a stiddy job, too." Jake wasn't in a very good humor, and he yelled: "Outside the guyropes, outside, I say," and hustled poor Jack out into the snow with his linen duster flying about his heels.

A friend of mine was on his "uppers" once and struck Jake for a job. He was told to come on in the morning. When he went to work at seven o'clock the assistant foreman gave him a car center to make, two in a flask, and showed him a big floor with three heaps of sand. He cut over one of the heaps and started to work, and after a while he asked the man across the gangway what was the matter with the fellows on those floors, pointing to the other two heaps. He almost collapsed when he was told the three heaps belonged to his floor, and unless he filled them Jake would give him "the run."

The next day I happened to be passing Timmerman's and I saw "Egypt" Mitchell looking out of the window. "Egypt" was the most enthusiastic Brotherhood man I ever met, and he hailed me as I passed to know if I had got a job yet, having seen me tackle the boss the day before. I told him I hadn't struck anything and I thought I would have to pull out. Then he began to talk Brotherhood to me and wanted to know if I would join. "What's the good of it to me?" said I. "You haven't a local anywhere in the South, and I've never run across any of your locals in the North." "Never mind," said "Egypt," "we've forty locals now, and inside of a year we'll have forty more. Now if you want to join I think I can work you into a good job." With that he hands me out a copy of the constitution and a red Journal and told me to come back the next day. "Where's the job?" said I. "Well, you just read over that Journal and study our laws," replied "Egypt," "then come back to-morrow and tell me what you think of them. If you want to be assessed to support the stove molders every time they strike, with never a dollar to help machinery molders when they are in trouble, stick to the Union; but if you want to help your own branch of the business, come over to the Brotherhood."

Now, I knew there was some truth in what "Egypt" said, because the strike down at Anniston hadn't been sanctioned until six months after it took place and the men who were entitled to support scattered all over the country; then the boys in Memphis told me of a strike that had been forced on them at the Milburn shop early in the spring, and it hadn't been sanctioned when I left, so I read the constitution and the Journal over carefully and came to the conclusion that the Brotherhood would be a good thing if the men whom it was intended to help would only stand by it.

The next day I went back and told "Egypt" that while I couldn't give up the Union just then, as I might want to work some place where they would be strong enough to shut me out of a job, yet I believed in the principles of the Brotherhood and would join it either there or somewhere else as soon as I got to work. We talked the matter over a little while, then he told me to meet him and "Dick" Barnett, who was the secretary of No. 40 and lived over in East St. Louis, that night, and they would see if they couldn't work me into a job in some of the shops.

(To be Continued.)

Does the Blast Meter tell the Truth?

By H. HANSEN.

It is hard to find a needle in a haystack, if you don't know where it is, and it is about as difficult a task to locate a blast meter in a foundry, especially one that is in a healthy

condition, able to meter something and not merely occupying space as an ornament. It is about as scarce as the adjustable clamp, and consulted in most cases only once a year when the inventory is being taken, and then it is counted in to help swell the assets.

When a new cupola is put up nowadays most foundries generally blow themselves for a "gauge" to accompany it and for a few days before the bright brass work becomes tarnished with oxidized foundry atmosphere, it is given more attention than the cupola itself. Everybody takes a hand in feeling of it, as if it possessed life and needed its pulse examined, but in a few days a change takes place when the novelty wears away. When a thick coating of dust obscures the figures along comes pie-faced Joe Noolan and planks his ladle against it. That settles the glass, or if there is a piece of rubber hose connected with it, this is sure to be monkeyed with until it succumbs. And talk about it being hard to get things for the foundry, you don't know what it is till you attempt to order repairs for a meter. It is something that you have got along without, and it has got to be ordered from Chicago, maybe. By the time it arrives, well, in some cases, the whole concern has left through the fire-escape, and is doing business under a different name.

When we see the column of liquid ascending we know that it is caused by the pressure of air exerted upon it from the blower increasing. We also take it for granted that the pressure recorded indicates that a certain amount of air is being forced into the cupola to accomplish the combustion of the fuel. Now, a man who does his melting by gauge entirely is about as much out of the way as one who has no meter at all; he is like a man who travels much and takes it for granted that the time his watch shows is everybody's time.

The first thing to look after is to see that the liquid in the meter stands at the zero mark before the blast is put on. Most assuredly you will say and wonder what causes us to make this commonplace remark, and we can justify our action by retorting that this matter is too often overlooked, and as the accuracy of the meter depends unequivocally upon a true adjustment, as this is the mainspring that guides to correctness, the importance of keeping an eye on this should not be underestimated.

Having adjusted the meter you turn on the blast, and in a minute or so, when the fan or blower is running at full speed, you have say 6 oz. of blast, ten minutes later you have probably 8 oz. and in half an hour maybe 12 oz. Now, do you suppose that at the end of half an hour, when the pressure reaches the maximum, that more air is being forced through the tuyeres than there was at the start when the meter only showed 6 oz? No, about the reverse is true. Your fan is running at the same speed and actually forced more air through the cupola at the start when the gauge only showed 6 oz., because the fuel and metal presented a more open mass than later, when melting begun, and the materials at the melting point are being burned together into a denser body offering a greater resistance to the passage of the air.

Any obstruction that may be placed or take place in the cupola tends to hinder the blast from penetrating and it will cause the meter to show a higher pressure, although the effect is that a smaller volume is entering. This is especially noticeable in running long heats, when the cupola becomes more or less clogged, and the blast meter can generally be depended on to show an increase of pressure, which, we admit, exists, but deny that it is any indication of an increased volume of air being fed to the cupola. With an empty cupola you will be able to force the greatest amount of air through it with the least pressure, as you charge it according to the compactness with which you pack the materials together. You are placing an obstruction in it that will affect the passage of the air and the indications of the meter at the same time. We are not trying to make you believe that any practice you may be pursuing is wrong. What we do desire to call your attention to is that a difference in the recording of the meter may be caused by other things besides the blower.

A blast meter does record pressure and most of the time fairly true the volume of air that is being furnished, but when conditions, other than those supposed to be present, appear, its indications are faulty and should be read not alone, but in connection with an occasional peep at the tuyeres.

A large volume of blast may enter the cupola at a low pressure with large tuyere area and coarse coke or a small volume of

blast and high pressure may be caused by a small tuyere area and the use of finely crushed coke, such as is found towards the bottom of all coke sheds where considerable of this fuel is handled. Now, you may be inclined to doubt that the size of coke is a factor to be considered in operating a cupola or that fine coke tends to retard the volume and increase the pressure. However, air, like water, will move in the direction of the least pressure, and we all know that a bucket of water will disappear faster through a pile of gravel than through a pile of sand, and if we applied a force to move this water through the gravel and the sand we would be able to force a far larger volume of water through the pile of gravel with a low pressure than a small volume through the sand with a high pressure. The volume passed through these two bodies at the same pressure would differ greatly. Why should not the same difference occur with air passed through bodies of different density in the cupola?

You find your neighbor using 14 oz. of blast and everything seems to go along fine, and then you try to do the same thing. You speed up your engine and the next time you meet him you relate what a hot time you are having to keep her up, and that it seems as if you got along better with 10 oz. "Something is wrong with your meter," says your neighbor, when the chances are that the gauge itself is perfect, while other conditions enter into your practice prohibiting you from duplicating the results he is obtaining.

The meter should never be consulted before the cupola itself. When looking for causes of general distress it is a bad policy to employ the meter as a detective to locate them as it is insensible to many of these and liable to carry you over a blind trail. If every revolution of the blower discharges so much air, would not a speed indicator placed therein furnish a more reliable guide than the blast meter?

Management of Cupolas.

Mr. Editor—There is nothing around a foundry that seems to be so little understood as the cupola and its management. It seems to have less attention paid to it by writers than any other thing connected with the business. In the course of my experience (which is a long and varied one) I have seen a great many mistakes or blunders made in the running of the cupola, such as hanging of charges, cold iron one day and hot iron the next, and all under the same conditions as regards the iron, fuel, etc., and charged to various causes, except the right one. The fact of a cupola working all right one day and all wrong the next, under the same conditions, as to amount of iron to be melted, same kind of iron, etc., started the writer to doing some tall thinking, and to come to the conclusion that under the above conditions the cupola had not been managed right, for with the same conditions existing the cupola ought and will melt the same to-day as yesterday. There is no law for the successful melting of iron, it requires experience in charging the proper amounts in certain sized cupolas, and also in selecting the sizes of iron that will melt the best and the proper places in the cupola to put them.

Now, there is no chance work in melting iron if the cupola is properly charged. This statement would imply that there is a law. I wish to be properly understood when I say there is no chance work. Proper charging means a great deal, and is the secret of melting iron successfully, and with a little coke as is necessary to make good hot iron. The question here arises what is proper charging? Now, we all know there are a great number of different kinds of cupolas, but there are very few used in the United States that have boshes or are drawn in at the tuyeres. We will take coke furnaces, that is cupolas that use all coke alone, as example, and I make the statement that in proportion to size, inside brick lining at tuyeres and height of tuyeres from sand bottom, they are directly proportional to each other; that is, a cupola 30 inches inside diameter at tuyeres and 12 inches from sand bottom to bottom of tuyeres will take the same amount of fuel in proportion for its bed as the cupola that is 42 inches diameter at the tuyeres and 12 inches from sand bottom to bottom of tuyeres, and the same amount of iron per charge in proportion one to the other. For example, let us take a 30 inch diameter cupola at tuyeres with 12 inches above sand bottom to bottom of tuyere, and 450 lbs. coke for bed and 75 lbs. coke between charges, with 1,000 charges of iron as units (and this is a safe charge, it will melt hot and fast).

Now, suppose you wished to charge a 42 inch cupola with sand bottom, 12 inches below tuyeres, the proportion would then read: 30:42::450:x or 450 multiplied by 42 and divided by 30 would equal 630 lbs., which would be required for bed of 42 inch cupola, then the amount of iron to be charged would equal 30:42::1,000: x or 42 multiplied by 1,000 and divided by 30 would equal 1,400 lbs. as the amount to be charged in 42 inch cupola with tuyeres 12 inches from sand bottom. Now the charges of coke after bed would be 30:42::75:x or 42 multiplied by 75 and divided by 30 would equal 105 lbs. of coke for 42 inch cupola and 1,400 lbs. of iron. Now, if the sand bottom is lower than this the same rule holds good, but it takes more coke and is often necessary where large ladles of iron have to be collected at one tap. We will suppose the tuyeres on the 30 inch cupola are 18 inches above sand bottom in place of 12, then the proportion would read thus: 12:18::450: x or 450 multiplied by 18 and divided by 12 would equal 675 lbs. for bed, the other charges would remain the same. Now this rule can be depended upon, for the writer has used it and been successful in every case, still he does not claim this as the only method of melting iron successfully, but claims it has worked very successfully for him, and he has had 35 years experience in the foundry and has been in charge of different cupolas for the past 20 years.

Mr. Sorge Replies.

Mr. Editor:—

In your issue of last month Mr. A. B. Frenier criticises the distribution of the expense items in the system of foundry costs which I presented before the Milwaukee meeting of the Western Foundrymen's Association. Apparently it would seem that the illustrations cited by Mr. Frenier strongly support his criticism, but a close examination of the subject shows that the basis of his argument presupposes an individual method of cost item divisions, which is the very point that I strongly objected to, insisting and showing it to be too expensive and cumbersome for practical use.

On page 18 of the September issue of THE FOUNDRY, lines 9-13, from the bottom of the first column, I say: "Such classification is vital and needs close study, in order to bring under each head work which shall involve in a general way a similar amount and character of labor." If the classification is not properly made it is liable to give wrong results, as illustrated in the criticism referred to, but if the expense cost is determined for each class as shown, and then figured out per pound of good castings produced in that class, we can safely use and apply these figures, as then the character and amount of labor on the different pieces in that class will be similar. The more complex and difficult the work is, the higher-priced will be the workman to whom its execution is entrusted. Also the greater will be the amount of supervision by the foreman, and the clerical assistance. Similarly there will be involved more favorable location for light, heat and power than when less important work is done, and naturally these will usually be used more thoroughly. Interest and repairs on buildings, taxes and insurance will naturally vary with the amount of use made of the building, which will be greater for the better facilities offered for the more expensive than for the cheaper work.

In order to avoid complications and to produce a cost system which shall be simple and direct, as well as accurate, I use only two accurately determined quantities, but exercise extreme care in the classification of the work.

A. SORGE, JR., M. E.

In these days when troubles between the employer and employee so often arise, and when strikes, lockouts and boycotts are common occurrences, it is interesting to note that in the Brown & Sharpe Mfg. Company, Providence, R. I., has a firm to which trouble with their employees has been unknown since they began business in 1872. Last Tuesday night a dinner was given, in which 32 men who have been in the employ of the Brown & Sharpe Mfg. Company for 25 years or more sat down to the table. A club to be known as the Brown & Sharpe Quarter Century Club was formed, and a president, secretary and treasurer elected. The members of the club represent every department of the shop from the superintendent down. As other men complete the term of 25 years during which they have worked for Brown & Sharpe they will be admitted to the club. There were those at the table who had seen 30, 35 and 40 years of service with the firm.

Pittsburgh and Vicinity.

The iron and steel market has assumed a much better tone since the announcement of the formation of the billet pool. The volume of business has not widened to any extent, however, but the substantial advance in some lines of steel material is encouraging to manufacturers.

Consumers of raw material are now aware of the fact that the chance for lower prices has passed and if they need stock they must purchase it at advanced prices. Several large users made contracts extending until July and are on the safe side. The present was considered an opportune time for the formation of the billet pool, since the great majority of billet consumers have but little stock on hand, they having continued to operate on the belief that still lower prices would be established.

Bessemer iron is quoted at $13.25 and $13.50 and firm, but predictions are being made that it will advance to $15 very soon.

The announcement of the season's prices for Lake Superior ores has removed some uncertainty as to future costs and has exercised a strengthening effect upon prices of Bessemer pig. Several matters are now going on which will change the situation of the iron and steel market very materially. First, the ore combination to govern the output and prices of Lake Superior ores; second, the combination of the southern pig iron producers of Tennessee and Alabama, the purpose being to place the entire products of the south under one management and last, the new pool fixing the price of steel billets at $20, Pittsburg.

There is always a certain amount of work being done and at this time there is quite a good business done in a small way; but it comes in such dribs that it is a mere drop in the bucket, while so many are competing for every order that makes its appearance. There is so much more productive capacity in operation than there was a year ago.

Since the prices for ore and coke have been fixed business cannot be done at the prices ruling. Quotations for long delivery are at a premium over those of short dates, and it is supposed that buyers must pay the advance or find the source of supply closed.

A large amount of work must be given out soon, or some plants will be compelled to close down, and it is hard to say in the face of higher figures, whether lower prices will be accepted to keep the machinery in motion or whether the buyers' requirements will be sufficiently urgent to compel them to pay going prices without further delay. Developments from now on will, therefore, be watched with intense interest, as they will shape the course of the market for months to come.

The following are the ruling prices for the different grades of iron:

Grey Forge	$10 75@11 00
No. 1 Foundry	12 75@13 25
No. 2 Foundry	12 00@12 50
Bessemer	13 00@13 50
No. 1 Charcoal Foundry	17 50@18 00
No. 2 Charcoal Foundry	17 00@17 25

Cast Iron Pipe.—The cast iron pipe market is said to be in a very satisfactory condition, the mills being kept busy.

Castings.—Foundries are kept fairly busy on large orders, but they could stand a great amount of more work. Prices are somewhat unsatisfactory and are quoted as follows:

	Cents per lb.
Chilled rolls, up to 12 in. diameter	3¾
Do. over " "	3¼
Sand and Homogeneous steel rolls and pinions up to 12 in diameter	2¾
Over 12 in diameter	2¼
V-tooth pinions, additional	¼
Housen and rolling mill castings not otherwise specified	2
Spindles and coupling boxes	1¾
Squeezer castings	2
Squeezer pinions and wheels	2½
Spur and bevel wheels, large	4
Spur and bevel wheels, small	3 to 2¼

Pig Tin.—Prices are ruling about 15¼@15¾ cents and the demand seems very fair. Quotations do not seem to vary much.

Copper.—The market for copper is quiet and stocks are increasing. Prices are weak, the rate being quoted at 11¼@11½ cents.

Pig Lead.—The market is being kept going in its usual style, the demand being rather slow with prices ruling at $3.25@$3.35.

Aluminum.—This metal is still experiencing a heavy demand and prices are being adhered to firmly.

Notes.

The Totten & Hogg Iron and Steel Foundry Company, of this city, is very busy at the present time. The company has just closed a contract with the Wyoming (Pa.) Shovel Company for a 16-inch special train of rolls complete.

The works of the James P. Witherow Company, at New Castle, are in full operation,

giving employment to about 200 men. The concern has quite a number of orders on hand.

The Derwent Foundry Company, of Ellwood City, has completed the foundations for an addition to its plant. A number of extra hands will be employed.

A fire recently broke out at the Aschman Steel Casting Company's works, at Sharon, causing a damage to the extent of several hundred dollars.

Messrs. Rose and Palmer have decided to rebuild the Bailey foundry, at Sharpsville, Pa., recently destroyed by fire. Work has been commenced and they expect to have it completed in the near future.

The Warren Casting Works were removed from Warren, O., to Youngstown, O., recently. An order was received lately from London for castings. Mr. E. Carter has been elected manager of the plant.

The Girard Stove and Foundry Company, of Youngstown, state that business is brisk in the foundry and roll departments and orders continue plentiful. Extensive improvements are also being made at these works. An addition to the main building is in course of erection and a new air furnace is being built in this adition.

The Chaplin-Fulton Manufacturing Company, brass and bronze founders, of this city, has just completed a 1000-pound bell to be shipped to Sacramento, Cal., and another of the same size to be placed in the Pitcairn public school, at Pitcairn, Pa. Shipment was made a short time since of a 1000-pound bell to Monroeville, Ind. The California Light and Fuel Company, of Passadena, Cal., has placed a contract with the company for a number of gas meters. The demand for meters seems to be increasing.

Here is a Chance.

One of our friends who sends us in yearly a great many subscribers from the city in which he resides, suggests that it might be a good plan to offer something in the way of an award to that molder who sends us the greatest number of subscribers in a given time. Acting on that suggestion, therefore, we desire to make the following proposition:

To the one sending in to this office prior to June 1st, 1896, the largest number of subscribers we will give a handsome molder's tool box with lock and key, together with a set of molder's tools, to the value of $25.00, list price.

To the one sending in the second largest club we will send tools to the value of $15.00, and to the one sending the third largest we will forward tools to the value of $5.00, and to the fourth largest list one volume of either West's or Bolland's works on iron founding.

The tools given are to be the well-known brand manufactured at Burr's Damascus Tool Works, Detroit, Mich., and the winners of the prizes to select such tools as they desire from their illustrated catalogue. The names of the prize winners to be published in our June issue. All parties competing must announce the fact when sending in clubs.

Chicago and Vicinity.

The Foundry business is about the same as it has been for two months. The only thing that can be said in its favor is that it does not get any worse, but remains in a stationary condition. Spring brings with it the usual amount of labor troubles. Nothing has been done in the way of legislation to settle these labor difficulties, except in a few states, where laws have been passed creating a board of arbitration. These laws, however, leave it optional with the parties involved, whether the board shall be called. The last legislature in this state passed a law of this kind, and its uselessness has been demonstrated in the cutters and trimmers' strike in this city. The board of arbitration met and secured the consent of the cutters and trimmers to arbitrate, but when the manufacturers were approached they refused, and as it is necessary to have the consent of both parties before the decision of the board will be binding the refusal of the manufacturers left the board powerless to settle the difficulty. The mere fact that a law is left to the discretion of the people, whether they will obey it or not, makes that law a dead letter. If a law of arbitration is to be had in this country let it be a national one, a law that will make it obligatory upon the employer and employe alike to submit their differences to arbitration. It seems that the manufacturers in all lines of trade would join hands and try to have a law of this kind passed through congress. It is as much, or more to their interest than to the workingmen, that the differences between them be settled by

arbitration, as they are the greatest losers in a strike, even though they win. There is no doubt but what congress would pass a law of this kind if appealed to by the manufacturing interests of the country. The employer can certainly have nothing to fear from a just law of arbitration, one that will compel both sides to submit their differences to a board or court, the decision of which will be binding upon both alike. The civil disputes of men are submitted to a court of law and decided, and there is no valid reason why labor disputes cannot be settled in a similar manner.

The Gates Iron Works are busy.

Cribben & Sexton are running three heats a week.

Westinghouse, Church, Kerr & Co., Cragin, Ill., will start their Foundry.

Chas. Smith Manufacturing Co., 175-177 Lake street, will open the Foundry at Columbia Heights, formerly run by the Pitts Manufacturing Co.

The Union Foundry Co., Grand Crossing, have received from the West Park Board a contract for 600 electric lamp posts. Each post weighs about 1,500 pounds.

C. Nellis has resigned his position as foreman of the Lake Shore Foundry Co. and R. Gibbs, of the East Chicago Foundry, succeeds him.

Mr. John Ramsey, of the firm of Tarrant & Ramsey, will sever his connection with that firm about May 1st, and open the Foundry formerly run by Clark & Raffen.

SILICON.

Questions and Answers.

In reply to G. W. R. for a good mixture of brass to stand water pressure of 200 pounds, I think the following composition will prove more easily worked and cheaper than the composition given by F. J. D.:

Sheet brass (old sheathing from ships' sides, of good quality)	30 lbs
Copper	5 lbs
Lead	2 lbs
Antimony	1 oz

I have made this for water filters turned inside and out and only 3-16 in. thick and each one tested to 200 pounds water pressure. The composition of F. J. D. will stand 2,000 pounds pressure. F. W. P.

I would like to ask some of your readers through the journal what process they employ in casting a large bronze nut on an iron or steel crew, the nut to be removed after casting. I have tried various methods, but almost invariably my casting has blow holes or is spongy and dirty on the top.

F. W. P.

Among the Foundries.

Reed's Foundry at Cairo, Ill., has been destroyed by fire.

The Elmira, N. Y., Machine & Foundry Co. has gone into the hands of a receiver.

The Gibson Foundry & Machine Co. is a new concern in Toronto, Ont.; capital $25,000.

The Standard Malleable Iron Co., in Muskegon, a new concern, are now running full blast.

The Boyce Foundry Co. has been changed to the Bunker Hill Foundry & Machine Works at Bunker Hill, Ill.

The Johnson City Foundry & Machine shop at Johnson City, Tenn., has been leased for one year to G. W. Sitton and T. J. Galloway.

John H. Kelly, for a number of years connected with the National Iron Works, New Brunswick, N. J., has entered into partnership with James Nichols, of Jersey City, where they will combine the old established Pavonia Foundry.

Five brothers constitute the Kelly Foundry & Machine Co. at Goshen, Ind., and divide the management of the works between them. They are Frank Kelly, president; Charles Kelly, vice-president; Edward Kelly, secretary and treasurer, and C. F. Kelly and Clark Kelly.

Wm. A. Harris, formerly of the Springfield Foundry Co. at Springfield, Mass., is helping to organize a new company in that city to operate a machine shop and Foundry. It will be known as the Harris & Baush Machine Tool Co.

Obituary.

Mr. Thomas White, the head of the Thos. White Stove Co., of Quincy, Ill., died at his home there, April 3d, in his 72d year. Mr. White was formerly a pattern maker and was held in very high esteem by all who knew him.

CAST IRON NOTES.

Devoted to Inquiries from Practical Foundrymen on the subject of Melting and using Cast Iron. Address all Inquiries to W. J. KEEP, care of The Foundry.

Small Cupolas.

On account of slag chilling above the tuyeres, 24 inches inside diameter is as small as should be used. The diameter may be drawn in to 18 inches just above the tuyeres, but it would be well to enlarge again below to about 24 inches to hold more melted iron. The writer has a cupola 19 inches inside with a continuous tuyere which is one inch high. The sand bottom is 9½ inches below the tuyeres. About 200 pounds of melted iron can be retained in the hearth before tapping. The blast is 9½ ounces from a fan, the coke bed is 90 pounds, the iron charges are 125 pounds pig and 75 pounds stove plate, and the coke charges are 20 pounds. A little over one ton is melted in one hour and one pound coke melts over eight pounds of iron. The intention is to leave the tuyeres at present and enlarge to 24 inches both above and below and make the sand bottom 12 inches below the tuyeres, so as to hold 500 pounds of melted iron. It is not often desirable to melt slow but a decrease of blast and increase of fuel will do it, and a deep hearth will keep the melted iron hot.

What does deflection indicate in testing Cast Iron?

One one-half in. test bar deflects .35 inches and breaks at 375 pounds, while another bar from another mixture breaks at 450 pounds with .25 inches deflection. Deflection is a measure of softness. It must first be determined what deflection accompanies the iron that makes the best castings for a given purpose. Any excess of deflection shows that more scrap can be used. Excessive deflection is caused by the grains of the casting being coarse and loosely joined. By closing up the grain the strength will be increased and deflection will be decreased. Very small deflection indicates brittleness. The deflection of the test bar should be used. A decrease of silicon will close the grain and either scrap or close grained pig iron may be used. By careful mixing of pig irons the strength of a half-inch bar can be kept up towards 450 pounds and yet the iron can be kept soft.

Clean Iron.

If the iron contains enough silicon to make it fluid and is hot, all dirt and slag will rise to the surface of the ladle and is skimmed off. With such iron, if any impurity enters the mold it will rise to the top so as not to injure the face of the casting. A skim gate will catch any foreign matter that enters with the iron. The gate should be kept full while pouring. When the iron enters the bottom of the mold the gate should be shaped to give the iron a whirling motion. The remedy for dirty iron is to have it hot and to skim it.

By dusting dry molding sand over the top of the ladle a tough covering will be formed on the surface of the iron which will catch on its under side any slag that rises, and it will prevent any bits of slag from breaking off and entering the mold with the iron.

Blow Holes in Plow Point Castings.

Chilling iron is so deficient in silicon, that it is not fluid enough to permit gas to pass through it so as to escape through the sides of the mold. Add enough silicon to give it sufficient fluidity to permit the escape of gases, and yet not to injure the chill. Use for this an iron with about 10 per cent silicon. It is better to melt chilling iron at the first of the heat because a cold cupola favors chilling.

By melting soft iron afterwards the hot cupola makes it softer. The iron at the end of the chilling iron, and at the beginning of the soft iron, should be used for large castings, so as to be sure to get soft iron for smaller castings.

Shrink Holes.

Open cavities and spongy spots at the center of a large casting are caused by the iron at the center of a casting remaining fluid until after the outside has become solid. The shell swells after it has become solid while the fluid metal at the interior decreases in volume on account of loss of heat. Each crystal of iron attaches itself to the inner surface of the solid shell, and as the last fluid iron crystalizes there is not enough to fill the space. This leaves a hole, or a large number of small spaces which appear as spongy spots. This is greatest in high silicon irons with the lowest external shrinkage, because such irons swell most after they are solid, and the center of the casting remains perfectly fluid until the last crystal is formed. Low silicon irons do not expand much after the shell is formed, and the whole mass becomes solid at once without leaving a fluid center. Low external shrinkage is accompanied by large internal shrinkage, and therefore high silicon irons are only fit for small castings of uniform thickness, while low silicon irons with high external shrinkage are used for large castings. The feeding head is the only guarantee against internal shrink holes.

CUPOLA BLOWER.

For the latest development in Cupola Blower construction and application, see BUFFALO FORGE Co.'s 1896 Sectional Catalogue, "America's Best, the World's Standard."

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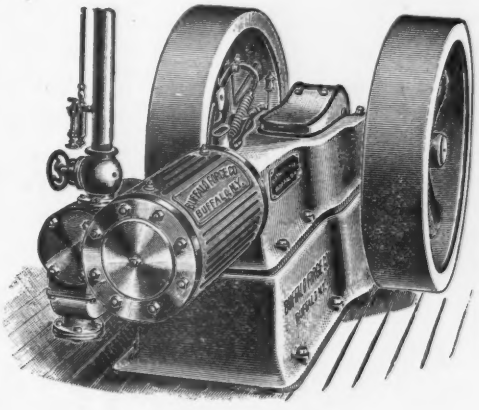

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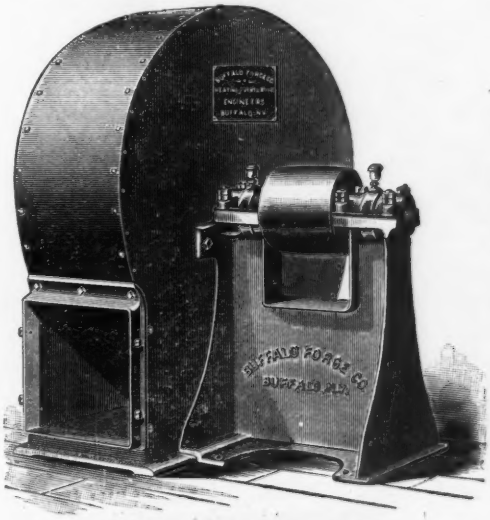

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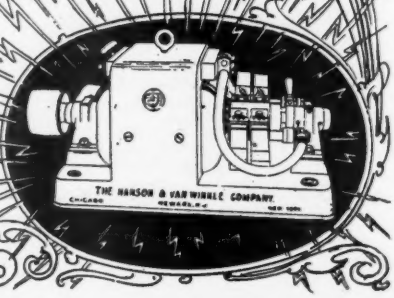

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—COMPANY.—
NEWARK, N.J.
CHICAGO. NEW YORK.

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Foundry Outfitting Co.	31
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Springfield Machine Tool Co.	47
Sterling Emery Wheel Co.	39
Stewart, W. H.	45
Stover Mfg. Co.	28
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Syracuse Chilled Plow Co.	39
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Taylor, Robt. J.	6
Taylor, Wilson & Co	24
Tompkins, Vreeland.	45
Translucent Fabric Co.	21
U. S. Graphite Co.	37
Ward & Nash	17
Washington Coal and Coke Co.	Insert
Wells Light Mfg. Co.	16
Whiting Foundry Equipment Co.	32
Wrought Iron Bridge Co.	8
Wilbraham Baker Blower Co.	11

THE FOUNDRY

The only foundry paper published in the world, and an authority on all matters pertaining to the foundry business.

RATES OF SUBSCRIPTION.

Single subscription to all parts of the United States and Canada, $1 per annum.
" " Universal Postal Union, 1.75 "
Eight or more subscriptions at one time, 75 cents each.

ADVERTISING RATES.

One page - -	per month, $20.00
Half page - - -	" 12.00
Quarter page - -	" 7.00

When space is specified an extra charge of five per cent. on the above figures will be made. All pages between front cover and reading matter reserved for whole page advertisements.

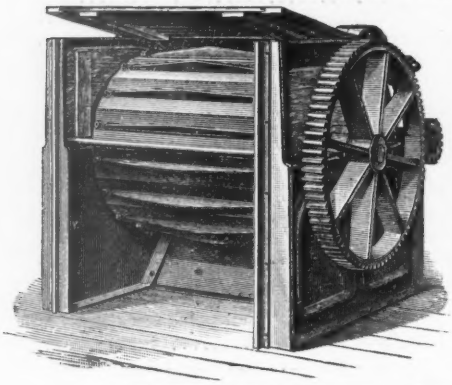
Advertisers in THE FOUNDRY have the privilege of discontinuing their advertisements at any time after they have had three insertions, and will only be charged pro rata for the number of insertions printed. They also have the privilege of changing advertisements as often as desired.

The publishers of THE FOUNDRY appreciate the fact that it is customary for publications, especially the class known as Trade Journals, to quote a rate for advertising from which greater or less discounts are given, according to the persistency of the advertiser. This system is manifestly unfair as tending to show partiality. We have deducted the usual discount before quoting rates, thus giving it to all alike, and no reduction of any sort on the abov rates can be made.

Copy for advertisements should be in by the 25th of the month preceding publication.

BROWN & SHARPE MFG. CO.

PROVIDENCE, R. I.



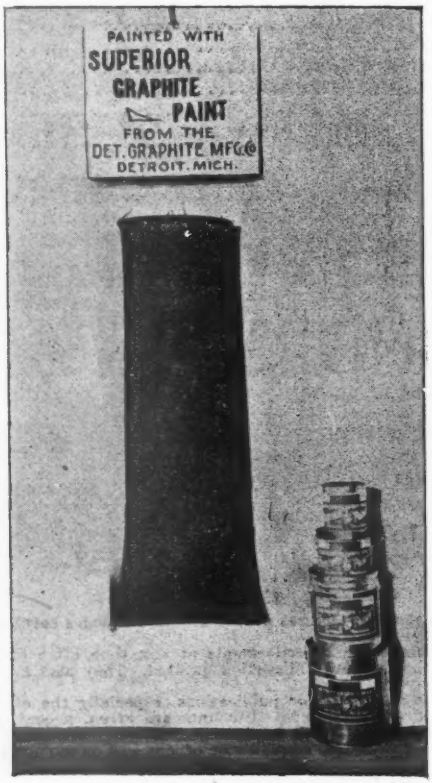
FOUNDRY RATTLERS.

No.	Diameter.	Length.	Floor Space.
1.	23½ in.	26 in.	44 in. x 54 in.
2.	31½ "	31½ "	58 " 64 "
3.	31½ "	52 "	69 " 82 "

These Rattlers have Iron Frames, Self-Oiling Boxes, and are so encased as to keep dust from bearings and the room.

Brown & Sharpe Mfg. Co.

PROVIDENCE, R. I.



There are two

kinds of Graphite Paint. The kind we make and the other kind.

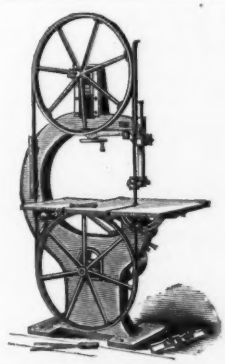
Ours is the best.

For Instance—we illustrate a bag painted with two coats and filled with water. This was painted four years ago. Since then it has frozen solid several times in the winter and evaporates more or less in the summer. We keep it filled though, and it never leaks a drop. You think that wonderful perhaps, but we can do plenty of other things with it equally as surprising.

If you want to paint a bag, smokestack, bridge, or piece of machinery of any kind use **"Superior,"** unless you want to do the job over again in a very short time. If you would like to know the names of some of our customers or anything about the paint itself write us, glad to answer letters.

Detroit Graphite Co.

DETROIT, MICH.



34 in. and 36 in. Band Saw Machine.

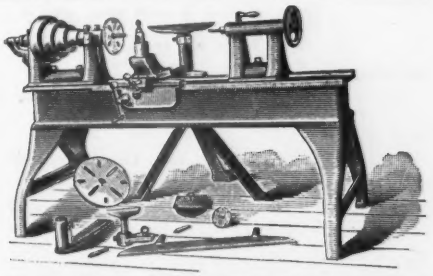
.. Complete Outfits ..

FOR

Pattern Shops

STRICTLY FIRST-CLASS TOOLS.

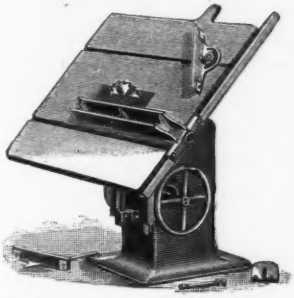
MANUFACTURED BY



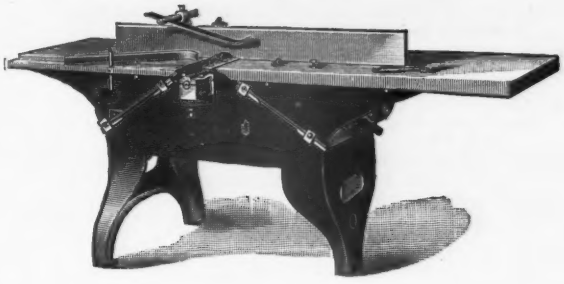
Pattern Makers' Lathes. Iron Bed with or without Carriage.

THE FRANK H. CLEMENT CO.

336 LYELL AVENUE, ROCHESTER, N. Y.



No. 1 Variety Saw Bench. All Iron and Steel.



MEXICAN GRAPHITE FOUNDERS' WASH

The guaranteed equal of any Silver Lead Facing. Applied with hand, shake-bag, or brush. Mixed in water, it makes A Perfect Wash for cores and dry sand work. Made from the pure product of our Graphite mine in Mexico, owned and operated by ourselves. This Facing is our specialty and is in use in over 900 foundries in the United States and Canada. It will save you over $5.00 per barrel in first cost alone, and is submitted subject to your entire approval.

THE UNITED STATES GRAPHITE CO.

Graphite Mines—
TORRES, SONORA, MEXICO.

Office and Factory—
SAGINAW, MICH, U. S. A.

NOTE.—Don't fail to ask us for some pencils. They are the finest in the world, and we keep them for gratuitious distribution, and esteem it a pleasure to supply them on request.

At a low estimate the world's production is 700,000,000 pencils annually. Nearly every high grade pencil, and over half of all the pencils made (over 350,000,000 per year) are made from our Mexican Graphite.

BUYERS' DIRECTORY.

ALUMINUM.
Cowles Electric Smelting & Aluminum Co., Lockport, N. Y.

AIR HOISTS.
Whiting Foundry Equipment Co., Harvey, Ill.

BARROWS, TRUCKS, ETC.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Lansing Wheelbarrow Co., Lansing, Mich.

BLOWERS.
Buffalo Forge Co., Buffalo. N. Y.
Connersville Blower Co., Connersville, Ind.
Garden City Fan Co. Chicago, Ills.
Root, P. H. & F. M. Company, Connersville, Ind.
Sturtevant Company, The B. F., Boston, Mass.
Wilbraham Baker Blower Co., Philadelphia, Pa.

BRONZES.
Cowles Electric Smelting and Aluminum Co., Lockport, N. Y.

CHARCOAL.
Springfield Facing Co., Springfield, Mass.

COKE.
Washington Coal and Coke Co., 7 Wood St., Pittsburg, Pa.

CORE COMPOUNDS.
American Glutrose Works, Philadelphia, Pa.
Stewart, W. H., 182 Front St., New York.
Vreeland Tompkins, Jersey City, N. J.

CORE OVENS.
Millett Core Oven Co., Brightwood, Mass.

CORE OVEN CARS.
Lansing Wheelbarrow Co., Lansing, Mich.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Foundry Outfitting Co., Detroit Mich.
Whiting Foundry Equipment Co., Chicago.

CRANES.
Addyston Pipe and Steel Co., Cincinnati, O.
Craig Ridgway & Sons, Coatesville, Pa.
Harrington, E., Sons & Co., Philadelphia, Pa.
Phœnix Iron Works Co., Cleveland, Ohio.
Shaw Electric Crane Co.
Wm. Sellers Co.
Whiting Foundry Equipment Co., Harvey, Ill.

CRUCIBLES.
Joseph Dixon Crucible Co., Jersey City, N.J.
McCullough-Dalzell Co, Pittsburg, Pa.
Taylor Crucible Co., Robt. J., Philadelphia, Pa.

CUPOLAS.
Foundry Outfitting Co., The, Detroit, Mich.
Springfield Cupola Co., Springfield, O.
Whiting Foundry Equipment Co., Harvey, Ill.

FIRE-BRICK.
Brooklyn Fire Brick Works, Brooklyn, N. Y.
Garden City Sand Co., Chicago, Ill.
Obermayer Company, The S., Cincinnati, Ohio
Paxson, J. W., & Co., Philadelphia, Pa.
Smith Foundry Supply Company, The J. D., Cincinnati, Ohio.

FLEXIBLE SHAFTS.
Stow Flexible Shaft Co., Binghamton, N. Y.
Chicago Flexible Shaft Co., Chicago, Ill.

FOUNDRY LADLES.
Foundry Outfitting Co., The, Detroit.
Obermayer Company, The S., Cincinnati, Ohio.
Paxson & Co., J. W., Philadelphia, Pa.
Phœnix Iron Works Co., Cleveland, Ohio.
Smith Foundry Supply Company, The J. D., Cincinnati, Ohio.
Whiting Foundry Equipment Co., Harvey, Ills

FOUNDRY PLANS.
Foundry Outfitting Co., The, Detroit, Mich.
Whiting Foundry Equipment Co., Harvey, Ills

FOUNDRY SUPPLIES.
Cleveland Facing Mill Co., Cleveland O.
Springfield Facing Co., Springfield, Mass.
Foundry Outfitting Co., The, Detroit, Mich.
Joseph Dixon Crucible Co. Jersey City, N J.
Garden City Sand Co., Chicago, Ill.
Obermayer Company, The S., Cincinnati, Ohio.
Paxson & Co., J. W., Philadelphia, Pa.
Smith Foundry Supply Co., Cincinnati, O.
The U. S. Graphite Co., Saginaw, Mich.

GRAPHITE PAINT.
Detroit Graphite Co., Detroit, Mich.

IRON BUILDINGS.
Berlin Iron Bridge Company, East Berlin, Conn.
Wrought Iron Bridge Company, Canton, Ohio.

IRON FILLER.
D. N. Clark & Co., Shelton, Conn.
Vreeland Tompkins, Jersey City, N. J.

MANGANESE AND SILICON.
Cowles Electric Smelting and Aluminum Co., Lock port, N. Y.

MOLDING MACHINES.
Pridmore, H. E., Chicago, Ill.
Tabor Mfg. Company, 39 Cortlandt st., New York
Taylor, Wilson Co., Allegheny, Pa.

MOLDING SAND.
E. M. Ayers, Zanesville, O.
Foundry Outfitting Co., The, Detroit.
Garden City Sand Co., Chicago, Ill.
Paxson & Co., J. W., Philadelphia, Pa.

PATTERN FILLETS.
Canton Fillet Co. Canton, Ohio.

PATTERN MAKERS.
The Gobeille Pattern Co., Cleveland, Ohio.

PATTERN MAKERS SUPPLIES.
Frank H. Clement Co., Rochester, N. Y.
The J. A. Fay & Egan Co., Cincinnati, Ohio.
Milwaukee Foundry Supply Co., Milwaukee, Wis.

SAND SIFTERS.
Wm. Sellers & Co., Philadelphia, Pa.
Taylor, Wilson & Co. Allegheny, Pa.

SAND BLAST.
Goodrich, & Co., F. A., Detroit, Mich.
Ward & Nash, Boston and Chicago.

SNAP FLASKS.
C. H. Green & Co., Syracuse, N. Y.

SPRUE CUTTERS.
Gould & Eberhardt, Newark, N. J.

TRANSPARENT ROOF.
Translucent Fabric Co., Quincy, Mass.

TROLLEY TRACKS.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.

TUMBLING BARRELS.
Brown & Sharpe Mfg. Co., Providence, R. I.
Paxson & Co., J. W., Philadelphia, Pa.
Stover Mfg. Co., Freeport, Ills.
Whiting Foundry Equipment Co., Harvey, Ills.

VENTILATOR IRONS.
Delvin, Thos. & Co. Philadelphia, Pa.

Sterling Emery Wheel Mfg. Co.

TIFFIN, O.

Manufacturers of

Sterling and Advance

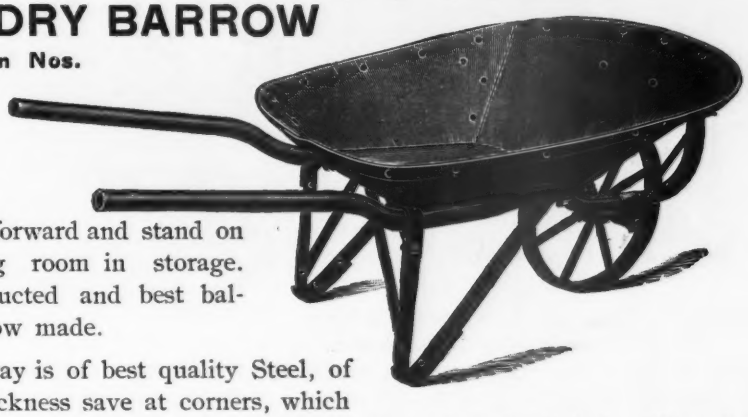
SAFETY EMERY AND CORUNDUM • WHEELS

With or Without Wire Web.

"SYRACUSE" Steel Wheelbarrows

FOUNDRY BARROW

Ten Nos.



All dump forward and stand on end, saving room in storage. Best constructed and best balanced Barrow made.

The Tray is of best quality Steel, of uniform thickness save at corners, which are of double thickness, being smoothly lapped and riveted. The edges are rolled over a band of steel riveted under the flange. The Legs have renewable Steel Shoes. Patent Steel Wheel with Staggered Spokes. Heavily braced throughout. The most durable and easily handled Barrow made. Steel Charging and other Barrows in variety. Send for handsome Illustrated Barrow and Truck Catalogue No. 6—just out—to

SYRACUSE CHILLED PLOW CO., Syracuse, N. Y.

"Columbus" Steel Tubular Wheelbarrow.

Made throughout of the best quality of high grade steel. Tray stamped without joint, seam or rivet, with edge bound over steel rod. Handles, Legs and Wheels the strongest put upon Tubular Barrows.

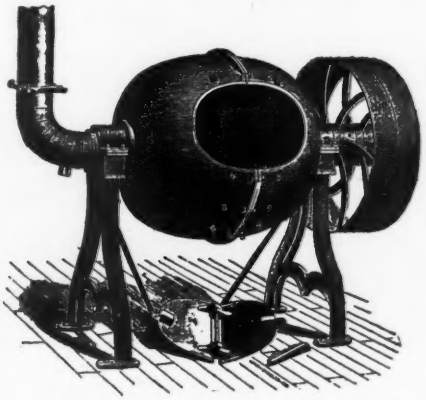
Made in nine different sizes. Largest manufacturers in the United States of TUBULAR BARROWS, STEEL CHARGING BARROWS and WOODEN BARROWS of every variety. Write for catalogue to

The Kilbourne & Jacobs Manufacturing Co.

LINCOLN STREET, COLUMBUS, OHIO.

STOVER'S IMPROVED

EXHAUST TUMBLING BARREL



The Stover Egg Shaped Barrel does double the work of any other with less noise and power. It gives the contents a double motion or action—from ends to center and from side to center—causing a thorough mixing and rubbing together of all the parts contained therein, cleaning and polishing the contents better and quicker than any other form of barrel.

Sent on 30 days approval to any responsible manufacturer of light castings, malleable iron wire nails, or any other small articles that require cleaning and polishing.

For full particulars, address,

Stover Manufacturing Co.

205 RIVER STREET,

FREEPORT, ILL

DO YOU MAKE YOURS?

? ? ? ? ? ?

HENRY HANSEN

In his paper read before the September meeting of the Western Foundrymen's Association said: "The ordinary chaplets for which almost every foundry used to rely on the blacksmith nearest at hand, which has probably been the cause of more castings being discarded and patched up than any other thing of their size are now being made by special methods and presented in a far superior condition, besides being placed on the market at a price that would not keep a blacksmith in tobacco, at the same time there are many foundries that still insist on making their own inferior Chaplets."

JOHN PETTIGREW

Superintendent of the Illinois Steel Company's foundry, at Joliet, Ills. said at the same meeting on this subject: "It is only about six months ago that I first bought factory-made chaplets. We were making our own chaplets and lost a great many castings from their not being properly made. After we had bought the first lot for, I think, 60 cents a hundred, I commenced to figure up the list of those we had made and found it had been at least $2.50 and besides were not as good an article."

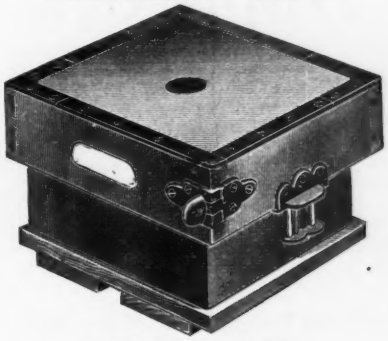
WE KEEP ALL KINDS IN STOCK.

Cleveland Chaplet & Mfg. Co.

CLEVELAND, OHIO.

Boutelle's Improved Snap Flask

FOR HEAVY WORK.



PATENTED JULY 17, 1894.

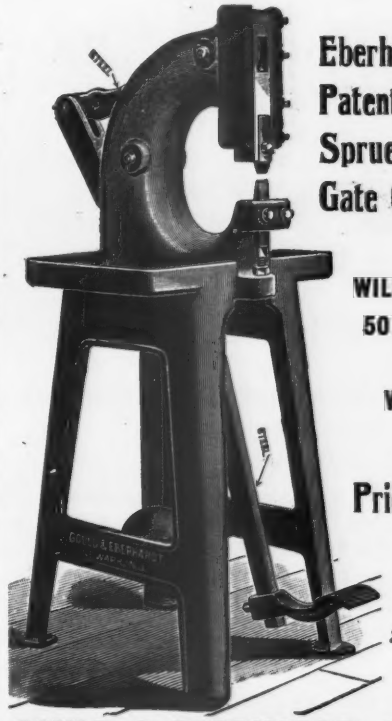
NO STRAINING OF WORK.

SAVES Floor Space SAND TIME MONEY

Send for Circulars and Price List,

L. W. BOUTELLE,

ORANGE, MASS.



Eberhardt's Patented Sprue or Gate Cutter

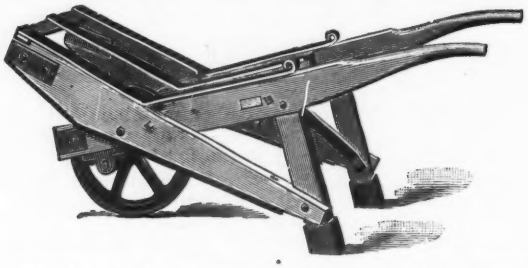
WILL STAND 50 YEARS OF WORK

Price Low

Send to

GOULD & EBERHARDT, NEWARK, N. J.

Pittsburg Open Hearth Barrow



Weight 160 lbs. The heaviest and strongest barrow made. Ironed with half inch iron. Cast iron shoes bolted on legs. The only barrow that will stand carrying pig iron or billets. It will be noticed by referring to dimensions below that the barrow, though so very heavy, is very compact, so the load is easily managed. Furnished with 40 lb. Cast Iron Wheel. Can only be used by strong men.

DIMENSIONS.

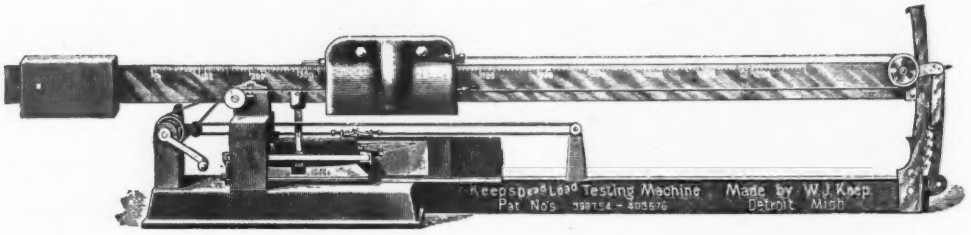
Handle 54 inches long. Length of Iron Work on top, 34 inches.
Telegraph name Scurvy.

WRITE FOR PRICES.

We make a large line of Steel and Wood Barrows and Warehouse Trucks.

LANSING WHEELBARROW CO., LANSING, MICH.

"Keep's Test" Apparatus.



HERE IS WHAT ONE LARGE CONCERN SAYS:-IT HAS PAID THEM, WHY NOT YOU?

DETROIT, MICH., March 31st, 1896.

Mr. W. J. Keep, City:

DEAR SIR: We have regulated our foundry mixture by "Keep's Test" during the past year, and can recommend it in highest terms. We know exactly what we are doing and can keep our castings of uniform quality. We find that .160 inches per foot the best shrinkage, and have been able to keep the average strength of a test bar ½ inch square and 12 inches long at 450 pounds.

Very truly yours,
LELAND & FAULCONER MFG. CO.,
H. M. LELAND, Vice-President.

To SAVE MONEY IN YOUR OWN FOUNDRY, ADDRESS **W. J. KEEP, Detroit, Mich.**

Brass Pattern Letters

FOR FOUNDRY PATTERNS

ILLUSTRATING LEADING STYLES

New Style Hair Line Gothic. Roman. Sharp Gothic. Flat Gothic. Antique Pointed.

BRASS PATTERN LETTERS AND FIGURES

For Sweating on Metal Patterns. THEY LAST FOREVER!

Can be Changed without Mutilation, from One Pattern to Another.

That is the kind you want.
That is the kind we make.
That is the kind to buy.

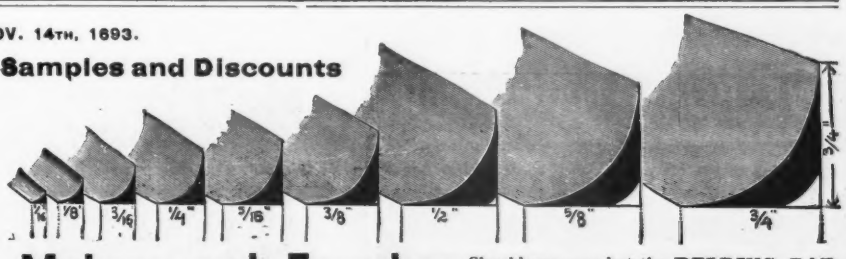
Send for Samples and Prices.
Orders Filled without Delay.

H. W. KNIGHT & SON,

Drawer 1154. SENECA FALLS, N. Y.

PATENTED NOV. 14TH, 1693.

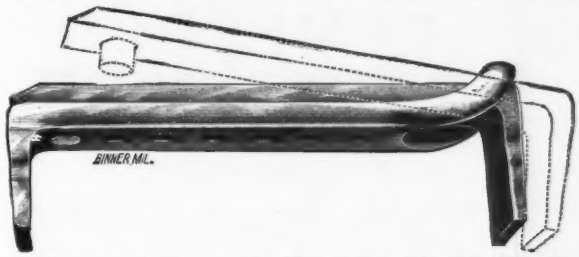
Write for Samples and Discounts



Pattern Makers and Founders

Should use none but the **BELDING PATENT LEATHER FILLET**, the only one made scientifically correct. Quickly applied to any corner, straight surface, single or compound curves, wood or iron, without nails or clamps. Once used, always used. Send sample order. **Proper Discounts will be Allowed You.**

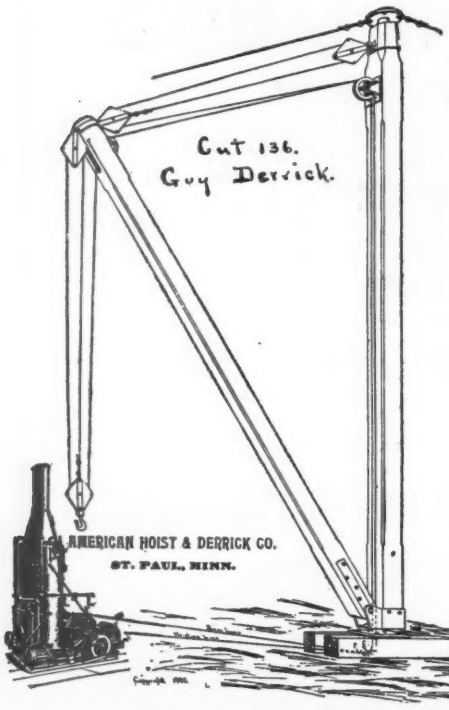
THE CANTON FILLET CO. **Canton, Ohio.**



THIS is our ADJUSTABLE CLAMP. The Most Convenient thing possible in any foundry. We also manufacture a large line of Rapping Plates, Lifting Screws, Etc.

Pattern Letters and Figures, Flask Clamps and Fittings, Leather Fillet Cutters, Universal Trimmers, Dowel Pins, Etc.

Milwaukee Foundry Supply Company, MILWAUKEE, WIS.



YARD DERRICKS!

The savings of a first-class YARD DERRICK compared with its cost are at the ratio of 16 to 1. Odds are 16 to 1 it will pay you to invest.

AUTHORITIES ON **DERRICKS** SPECIALISTS IN **HOISTS**

..AMERICAN..

Hoist & Derrick Company

ST. PAUL, MINN.

CHICAGO—60 S. Canal St.
CINCINNATI—Carew Bldg.
NEW YORK—Havemeyer Bldg.

WE BURN HARDWOOD

CHARCOAL

FOR FIRES.

CAR LOTS DELIVERED TO ALL PARTS OF THE U.S.

OUR CHARCOAL FACING FOR

BRASS FOUNDRIES

IS UNLIKE ANY OTHER.

IT WILL PAY YOU TO KNOW ABOUT IT.

SPRINGFIELD FACING CO.

SPRINGFIELD, MASS.

C. D. ZIMMERMAN, PROP.

TEMPERED STEEL WIRE BRUSHES

OF EVERY DESCRIPTION

123-131 NORWOOD AVE.

BUFFALO, N. Y.

"Smooth On" Cores

"SMOOTH ON" LIQUID T COMPOUND CORES

A liquid compound for making cores.
Prepared ready for use to mix with the sand, for LARGE and SMALL CORES.
Intricate cores can be made with our rods.
Will not absorb moisture and will keep any length of time.
Are hard, strong and will bake with clean, sharp corners.
All castings will be true to core size.
Will not blow or sputter.
Works with new or old sand.
Try it and be convinced.
Send for circular and sample.

"Smooth On" Castings

"SMOOTH ON" IRON T COMPOUND CASTINGS

Will stop a hole steam tight or Repair a defect in Castings and often save 100 times its cost in time and money in repairing defects in Cast Iron Patterns or other Castings . . . . . .

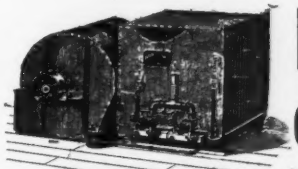
VREELAND TOMPKINS, Manufacturing Chemist, 533 COMMUNIPAW AVE., JERSEY CITY, N. J.

W. H. Stewart's ..LIQUID.. Core Compound

Used by the Principal Foundries in the U. S.

Prepared ready for use in **LIQUID FORM** to be mixed with the regular core sand. The cores are **DAMP-PROOF** and do not absorb moisture. **SPUTT RING** and **BLOWING** by reason of damp cores are avoided. The cores are **HARDER, FIRMER** and **STRONGER** than can be made by any other process and cost less to make. They can be set at any time and **EASILY CLEANED FROM THE CASTING.** Send for our descriptive pamphlet with prices and directions for use.

W. H. STEWART,
SOLE MANUFACTURER,
182 FRONT ST. NEW YORK.



SEND FOR CATALOGUE.

HOT BLAST APPARATUS
VENTILATING, DRYING, HEATING.
GARDEN CITY FAN CO.
MANUFACTURERS OF EXHAUST FANS. PRESSURE BLOWERS, ETC. CHICAGO, ILL. U.S.A.

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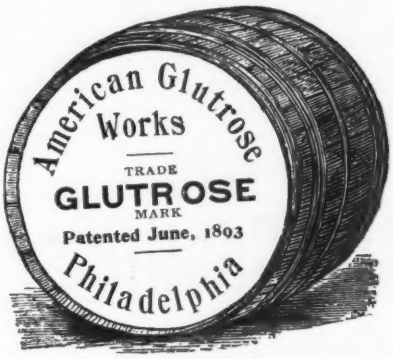

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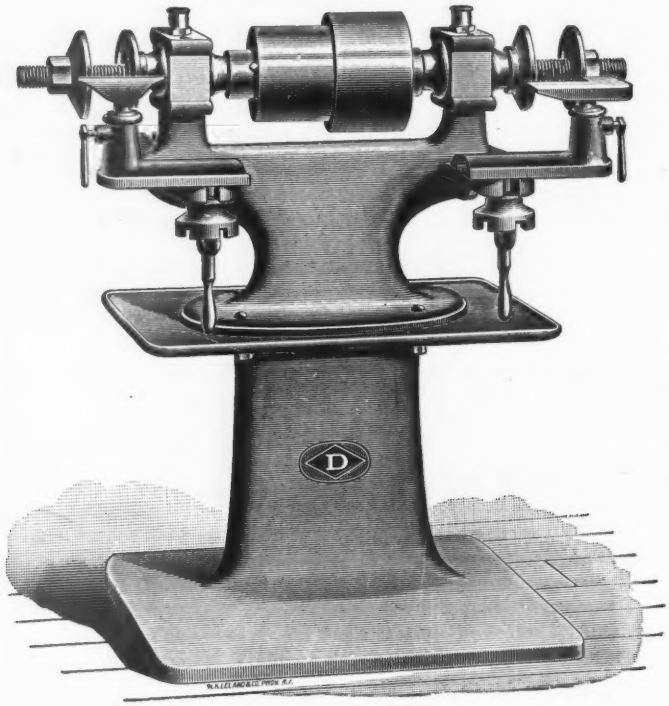

This machine carries two wheels up to 20 inches in diameter. It stands 34 inches from floor to center of spindle. Distance between wheels, 26 inches; length of bearings, 6 inches; diameter of spindle between flanges, 1½ inches. The weight of machine as shown, 750 lbs.

For foundrymen, plow manufacturers, stove makers and all others who need a heavy, substantial grinder, this machine cannot be too highly commended. Realizing that one style of machine does not suit the ideas of everybody, we have constructed a large line of grinders for all purposes, including many special devices.

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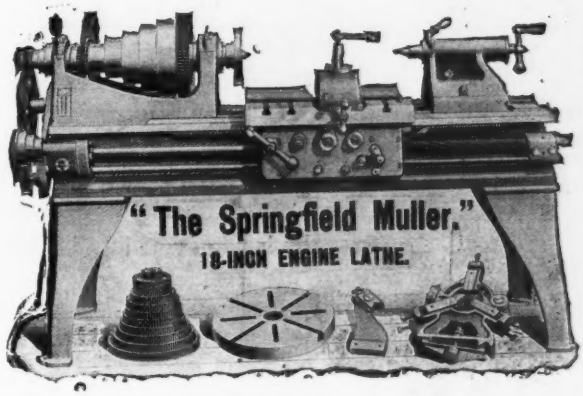

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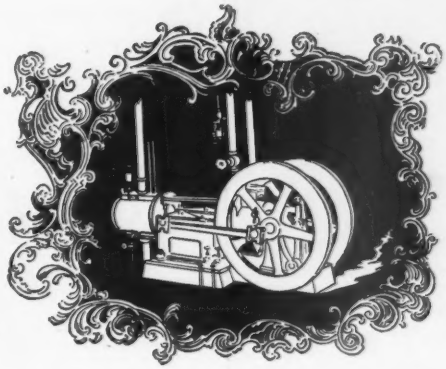

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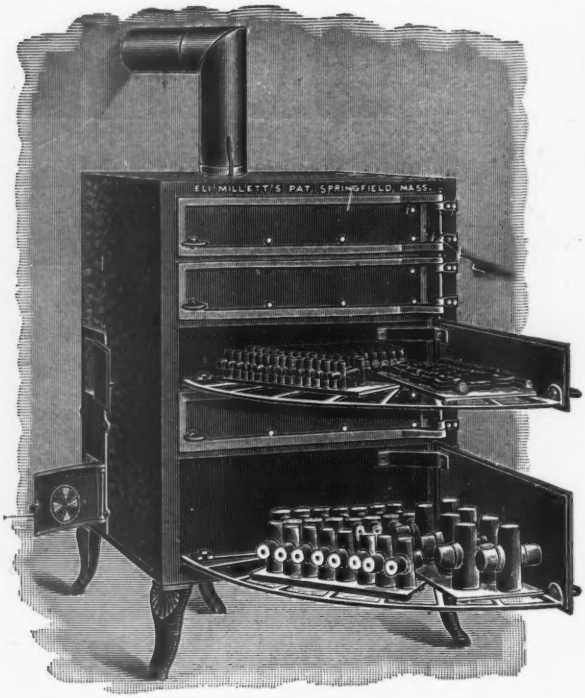

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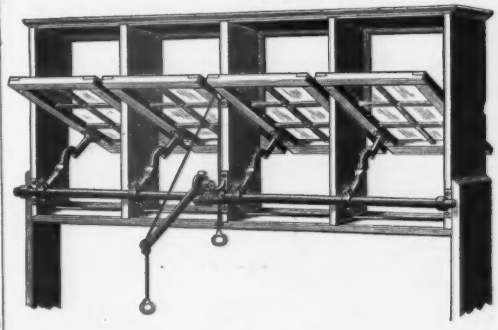

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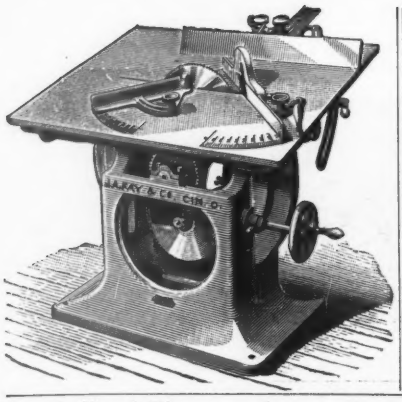

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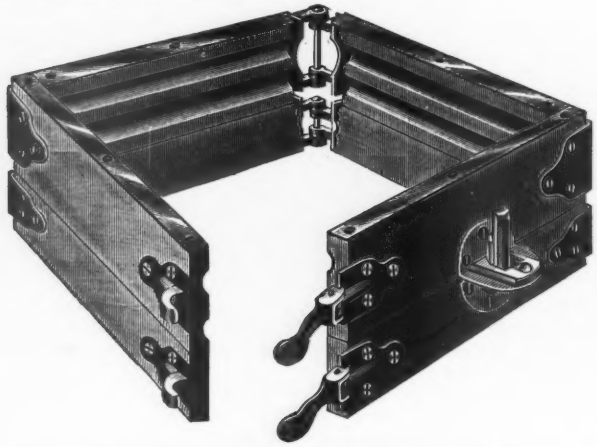

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